I Z A Institute
of Labor Economics
Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12554

Displacement, Diversity, and Mobility: Career Impacts of Japanese American Internment

Jaime Arellano-Bover

AUGUST 2019

I Z A Institute
of Labor Economics

Initiated by Deutsche Post Foundation

DISCUSSION PAPER SERIES

IZA DP No. 12554

Displacement, Diversity, and Mobility: Career Impacts of Japanese American Internment

Jaime Arellano-Bover
Yale University and IZA

AUGUST 2019

ISSN: 2365-9793

IZA – Institute of Labor Economics

Schaumburg-Lippe-Straße 5–9
53113 Bonn, Germany

Phone: +49-228-3894-0
Email: publications@iza.org

www.iza.org

ABSTRACT

Displacement, Diversity, and Mobility: Career Impacts of Japanese American Internment*

One of the largest population displacement episodes in the U.S. took place in 1942, when over 110,000 persons of Japanese origin living on the West Coast were forcibly sent away to ten internment camps for one to three years. Having lost jobs and assets, after internment they had to reassess labor market and location choices. This paper studies how internees' careers were affected in the long run. Combining Census data, camp records, and survey data I develop a predictor of a person's internment status based on Census observables. Using a difference-in-differences framework I find that internment had a positive average effect on earnings in the long run. Chiefly due to strong pre- WWII anti-Asian discrimination, the comparison group is composed of non-interned Japanese and Chinese Americans. The evidence is consistent with mechanisms related to increased occupational and geographic mobility, possibly facilitated by the camps' high economic diversity. I find no evidence of other potential drivers such as increased labor supply, or changes in cultural preferences. These findings provide evidence of labor market frictions preventing people from accessing their most productive occupations and locations, and shed light on the resilience of internees who overcame a very adverse initial shock.

JEL Classification: J61, J62, N32, O15

Keywords: labor mobility, displacement, Japanese American Internment, WorldWar II, diversity

Corresponding author:
Jaime Arellano-Bover
Yale University
Department of Economics
37 Hillhouse Ave.
New Haven CT, 06511
USA

E-mail: jaime.arellano-bover@yale.edu

* An earlier version of this paper was the second chapter of my dissertation at Stanford University; I thank Ran Abramitzky, Caroline M. Hoxby, Luigi Pistaferri, and Isaac Sorkin for their thoughtful advice. Manuel Arellano, Barbara Biasi, Leah Boustan, Liran Einav, Joseph Ferrie, Nate Hilger, Gordon Leslie, Guido Martirena, Kris James Mitchener, Petra Moser, Santiago Pérez, Nicola Pierri, Caio Waisman, and seminar participants at various institutions and conferences have provided very useful comments that have enriched this paper. This project benefited from the support of a Shultz Graduate Student Fellowship in Economic Policy through a grant to the Stanford Institute for Economic Policy Research, as well as a Summer Research Fellowship from the John M. Olin Program in Law and Economics at Stanford Law School. Their financial support is gratefully acknowledged.

"Only what we could carry" was the rule; so we carried Strength, Dignity and Soul.
—Lawson Fusao Inada

1 Introduction

In 1942 the U.S. government forcibly removed over 110,000 people of Japanese origin from their homes on the West Coast and sent them to ten internment camps in remote locations of the country, triggering one of the largest population movements of U.S. history. The communities that developed in these camps until their final closing in 1945 were completely new. Daily roles and activities changed, and individuals were surrounded by people from very different backgrounds than the ones they had encountered in their previous lives (Spicer et al., 1969). After leaving the camps and having lost previous jobs and assets back home, many families and individuals had to start from scratch and reassess career and location choices.

This paper seeks to study the long-run career impacts of this displacement episode for those affected. That is: several years after internment, how different were the earnings, occupations, and residential locations of former internees, relative to those they would have had if they had not been incarcerated? Studying this question provides an opportunity to learn about economic forces and mechanisms (recovery from economic loss and displacement, labor mobility, peer interactions) surrounding an episode of historical importance.

The answer to the above question is not obvious. On the one hand, internment constituted a huge negative shock. The contemporaneous costs for those affected were large, evident, and hard to quantify. Not only did internees lose their freedom of movement and civil rights. They lost previous jobs, experienced detachment from the outside labor market, and were displaced to remote locations far away from their homes. In many occasions they were forced to sell their assets at "fire sale" prices before being taken away. In short, they experienced huge economic loss and personal hardship. All these circumstances suggest that, either from labor-market detachment or from the loss of personal wealth, the future labor market prospects of internees could have been persistently affected in negative ways.

On the other hand, the pre-internment locations, jobs, and social exposure of Japanese Americans may not have been optimal from a labor market perspective. Family ties, community preferences, migration costs, and lack of information are all labor market frictions that may hinder individuals' long-run outcomes through underexposure to locations and jobs where economic opportunities are best. Precisely due to the losses at home and to geographic displacement, many internees were forced to re-optimize and start from scratch after release, possibly inducing migration to areas and occupations where opportunities were greater.[1]

Making the most of a new start might have been enabled due to the economic and human capital diversity present in the camps and the resourcefulness of internees. In 1942

[1] Improved labor market outcomes in the aftermath of forced displacement have very recently been documented in other settings. See Nakamura et al. (2019), Sarvimäki et al. (2019), or Deryugina et al. (2018).

Japanese Americans were represented in all strands of society, from highly educated urban professionals, to small farm and business owners, and to rural laborers. In the camps, many experienced less economic and human capital segregation than in their former lives. Living arrangements in the camps and interactions with others, in very close proximity and for a prolonged period of time, could have enabled exchanges of information, gathering of skills, and changing aspirations. These could have been channeled through peer exposure, or more formally by the numerous and popular internee-operated adult education programs (Su, 2011).

Understanding how and to what extent these circumstances affected internees' prospects is valuable for two main reasons. First, the shock of mass internment—unrelated to labor market trends—provides a suitable environment to study questions related to displacement, mobility, and labor market frictions. Second, getting a better understanding of the long-run consequences and responses to a key episode in the history of the U.S. and of Japanese Americans in particular.

This paper proceeds in several steps. I first estimate the long-run average causal effect of internment on earnings using a difference-in-differences (DiD) framework. This approach compares outcomes of interned Japanese Americans before and after internment with outcomes of a comparable group of Asians living in the U.S. and not subject to internment. When choosing this comparison group, it is key to account for institutionalized discrimination towards Asians before WWII—especially in the West Coast—and its decline thereafter (Hilger, 2016). For this reason, the comparison group consists of a combination of West Coast Chinese and non-interned Japanese Americans (those who were living outside the West Coast in 1942). While West Coast Chinese Americans faced similarly severe pre-war racial discrimination, China was a U.S. ally. Because Japanese Americans who did not live on the West Coast were fewer in number and far from areas considered important for the war in the Pacific, they were able to avoid the racially-motivated anti-Japanese drive that led to mass internment. Although limited by the amount of pre-WWII data, I provide evidence indicating that these groups had similar incomes in 1940 and were on similar trajectories.

I combine data from different sources. I start from the 1940, 1950 and 1960 U.S. Censuses (Ruggles et al., 2015), which include information on income, race, and place of residence. A key empirical challenge is that future or past internment is unobserved in Census data.[2] To address this issue, I develop a method to estimate the probability of internment conditional on Census observables, combining Census data with two additional datasets: administrative camp records, and a sociological survey from the 1960s which interviewed around 4,000 Japanese Americans (Levine and Rhodes, 1981). The value of the camp records is that it lists everyone that indeed was interned, while the survey asks respondents to describe their migration history in the U.S. Combining the administrative records with the 1940 Census, I first use Bayes' Rule to predict internment based on Census observables in a nonparametric

[2]While race and state of residence in 1940 would be an almost perfect predictor of internment, it is harder to do this in 1950 and 1960 data. This is due to two reasons. First is the cross-sectional nature of the data and the lack of information regarding place of residence at the time of internment. Second is the large migration and dispersion of former internees across the U.S. after leaving the camps.

way. Then, I use the survey information on migration patterns to modify the estimator in a way that takes post-internment moves into account, which permits applying it to 1950 and 1960 Census data.

Following this approach, the results indicate that internment had a long-run positive and large effect on the annual income of internees (5 and 15 years after the closing of the camps). This finding is robust to modifications of the control group (Chinese only, non-interned Japanese only, or both) as well as to different empirical specifications.[3] The magnitude of this effect ranges from 9% to 22% of the counterfactual average income.

A potential concern is the existence of differential trends in post-war racial discrimination towards Chinese and Japanese Americans that could confound the effects of internment (e.g. government or society "compensating" internees). The historical literature does not suggest such a large distinction, and it has studied the change in anti-Asian discrimination of these two groups as a whole (e.g. Wu, 2013; Hilger, 2016). An important historical asymmetry, if anything, favored the Chinese; they were first allowed to naturalize in 1943 while Japan-born residents were only allowed to do so in 1952. It was not until the 1980s that the injustice towards internees was formally acknowledged and compensated. Finally, it is reassuring in this respect that DiD point estimates are similar (although noisily estimated) when using only non-interned Japanese as comparison group.[4]

In the second part of the paper I investigate potential explanations behind this result and find evidence consistent with two complementary channels. The first is the re-optimization of location and career decisions after internment. The second is the exchange of information and skills mediated by the high economic and human capital diversity of the camps.

The 1960s survey asked Japanese Americans retrospective questions about their occupational history, their places of residence in the U.S., and whether they were in an internment camp or not. I find that internees experienced more occupational and geographic mobility compared to non-interned Japanese Americans. A 19% higher probability of having changed occupation after the war, and a 24% higher probability of living in a different state.[5] In addition, the occupational mobility effect is almost entirely driven by those young internees who were previously working in farming jobs, who climbed the occupational ladder into professional and technical occupations. If *forced* displacement indeed led people to move to jobs and locations with better opportunities (even when displacement reduced wealth that could have financed these moves), this would imply that adjustment costs were playing a big role before internment, or that the experience provided information and/or skills that enabled these moves.

[3] Due to the small number of non-interned Japanese Americans, the estimated effects when *only* using them as control group are imprecisely estimated and not statistically significant at conventional levels. However, they are very similar in magnitude to the precisely-estimated ones that arise when using the other control groups (Chinese Americans only, or Japanese *and* Chinese Americans together).

[4] A second potential concern is the result being driven by negatively-selected migration to Japan after internment. In Appendix C, I combine historical accounts with a "worst-case"-scenario empirical exercise in the spirit of Lee (2009) and Horowitz and Manski (2000) to show that the positive effects are robust to conservative (and arguably implausible) cases of heavily-selected out-migration.

[5] I show that destination states were ones that experienced higher postwar growth relative to the states that internees left behind.

Although limited by data availability, I consider if access to new information and skills could have played a role. Camp life was filled with hardship, and it intrinsically led to much more intense interactions than in regular communities. In addition to a strong social fabric, camps featured adult education programs taught and operated by skilled internees that became very popular (Su, 2011). I begin by documenting the economic and human capital diversity present in the camps. Each of these ten communities housed people from all educational levels, urban/rural origin, and occupational skills. Combining camp records with 1940 Census data, I provide a novel descriptive comparison between the level of economic diversity in the camps with that present in the immediate communities of similar size where West Coast Japanese Americans lived before internment. This analysis shows that the shares of highly educated and highly skilled workers in the camps were larger than that in the previous communities of residence of most internees.

If camp interactions generated any productive responses (through social exposure or education programs), it is plausible that they particularly accrued to the less educated and less skilled. In accordance with this idea, I use Census data to show how in 1950 and 1960 internees were more equal as a group (in terms of income) than the counterfactual offered by the DiD control group. Relatedly, the survey data is suggestive of a lower intergenerational correlation of income for those Japanese Americans who were interned, with this differential being mostly driven by the poorer families.

Using the richness of the survey I also show that the data is not consistent with other potential mechanisms that could explain the long-term earnings result. These potential mechanisms include responses in labor supply or work effort, as well as changes in work attitudes more generally, or cultural and assimilation preferences.

Finally, to tackle more directly the notion that internment allowed to lift barriers preventing individuals from accessing certain occupations and locations, I revisit a Roy model of occupational choice with occupation/group-specific frictions based on Hsieh et al. (2013). The model provides a mapping between statistics of the income and occupation distribution and the labor market barriers faced by each group (internees and non-internees) when accessing different occupations. I find that the frictions that internees faced relative to the control group decreased after internment in professional, white collar, and blue collar occupations.

This paper contributes to three strands of literature. By documenting how a forced displacement shock made individuals re-optimize in ways that improved their long-run labor market outcomes, I speak to a developing literature studying the relationship between geographical displacement shocks and labor market outcomes (Nakamura et al., 2019; Sarvimäki et al., 2019; Deryugina et al., 2018; Bauer et al., 2013). I document these mechanisms in one of the largest policy-driven displacement of people in U.S. history, which not only forced those affected to leave their homes but kept them incarcerated for a significant amount of time. The forces at play in these episodes are also related to the literature on factor misallocation (Hsieh and Klenow, 2009). Hsieh et al. (2013) show how barriers preventing women and blacks from accessing the occupations where they had the highest

comparative advantage were prevalent in the second half of the 20th century and how this had a considerable impact on aggregate output. Applying their occupational choice model to a new setting, I show how frictions preventing labor from flowing to its more productive uses declined for a large group of individuals after the internment experience.

This paper also contributes to the literature that studies peer influences, social contact, and access to opportunity. Recent evidence indicates that communities of residence could have significant impacts on long-term outcomes of children and young adults (Katz et al., 2001; Chetty et al., 2016; Chyn, 2018). Chetty and Hendren (2018) provide evidence of a negative correlation between neighborhoods' ability to improve their resident children outcomes and socioeconomic segregation. Guiso et al. (2015) find that individuals growing up in a dense firm area are more likely to become entrepreneurs later in life. My findings offer suggestive evidence indicating that the economic diversity of the camps and the educational opportunities within them could have opened up the path to new occupations and locations for internees, in spite of the fact that, differently from other settings, this event happened during their adult life.

Finally, this paper contributes to empirical work that has studied different aspects of Japanese American internment. Saavedra (2015) finds negative effects on educational outcomes of children who attended internment camp schools. In other work he finds that early-childhood internment led to shorter lifespans in the long run (Saavedra, 2013). Shoag and Carollo (2016) use internment as an exogenous geographical shock to study the causal effect of place. They carry out an internee-internee comparison of later outcomes based on place of residence, using the variation driven by the quasi-randomness of camp assignment. The paper closest to this one, related to labor market consequences of internment, is Chin (2005). She studies the long-run effect of lost labor market experience during internment. Using cross-sectional 1970 Census data she finds that, among (likely) former internees, the earnings difference between cohorts who were of working and non-working age in 1942 is more negative than that observed in other comparison groups. Under the assumption that labor market prospects of school-aged internees were unaffected by internment, she interprets this differential as a long-run negative earnings effect of lost labor market experience. While this result seems at odds with the findings of this paper, Chin (2005) notes her results are based on internee-internee comparisons, and cannot thus be considered overall effects of internment.[6]

This paper adds to this literature in several ways. First, I develop a methodology that combines different publicly available datasets and allows to nonparametrically estimate a person's probability of internment based on Census observables. These propensity scores

[6]Saavedra's work (Saavedra, 2013, 2015) brings new evidence to gauge the assumption that young internees' labor market prospects were unaffected by internment. When comparing with this paper's findings, it is relevant to note that Chin (2005) restricts attention to U.S.-born Japanese Americans and coarsely defines as interned those who were born in the targeted states of Washington, Oregon, California, and Arizona. Abstracting from first generation internees does not take into account around 35% of the total number of internees. Also, even when focusing on U.S.-born Japanese Americans, tabulations of the JARP surveys (which explicitly asked for past internment) indicate that mobility across states between birth and 1942 meant that 14% of those born in the targeted states were not interned, and that 18% of those born in the remaining continental U.S. states were indeed interned.

allow the study of large numbers of internees both before and after internment, and to derive a general understanding of the career consequences (earnings, occupational choice, migration) of internment. Second, I study the economic composition of the internment camps and analyze their human capital and economic diversity in comparison to the communities where Japanese Americans previously lived.[7] Finally, I test whether internment had any long-run effect on attitudes and preferences related to work, culture, and assimilation.

The remainder of this paper is organized as follows. Section 2 describes the historical background of Japanese American internment and relevant features of life at the camps. Section 3 describes the three main datasets I use. Section 4 discusses the empirical approach, including the procedure to predict internment status on Census data. Section 5 presents the results of the long-term causal effect of internment on income. Section 6 provides evidence on the potential mechanisms behind the income result. Section 7 presents the occupational choice model along with its results. Section 8 concludes. Different appendices provide supplementary analyses and robustness checks.

2 Historical Background

Japanese immigrants began arriving in large numbers to the U.S. during the end of the 19th century, settling predominantly along the West Coast.[8] The flux of Japanese immigrants increased during the first years of the 20th century but substantially decreased starting in 1908 due to restrictive immigration laws.[9] These laws resulted in virtually zero new Japanese immigration arriving to the U.S. between 1924 until 1952, when very small numbers of migrants from Japan started being allowed into the country again.[10] These legal restrictions shaped the demographic composition of Japanese Americans, which featured a "missing generation". This created a sharp distinction between first-generation Japanese (the Issei) and their American-born children (the Nisei).[11] By 1940 there were over 120,000 Issei and Nisei living in the U.S., the vast majority of them living in the West Coast states (see Figure 1). Discrimination against Asians was widespread and institutionalized before WWII, especially in areas where they were more numerous, such as the West Coast (Hilger,

[7] At the rather fine geographical level of the Census enumeration district.

[8] A mention to the Japanese people who migrated to Hawaii is in order. Japanese laborers arrived to Hawaii in large numbers before this happened in the U.S. mainland. Also, between 1891 and 1907 an important number of them migrated from Hawaii to the continental U.S. However, this flow was stopped by the Immigration Act of 1907 that prohibited Japanese laborers from Hawaii, Mexico or Canada to move to the continental U.S. As Spickard (1996) explains, the experience of the Hawaiian Japanese and the Japanese Americans in the mainland (the focus of this paper) was very different due to the different immigration periods and the very different economies, cultures, and policies in the mainland versus Hawaii. In 1942 the Japanese made up almost 40 % of the population of Hawaii. Also, it was not until 1959 that Hawaii received statehood.

[9] The so-called "Gentlemen's Agreement" of 1908 aimed at drastically reducing labor migration from Japan to the U.S. The Immigration Act of 1924 effectively and successfully banned Japanese immigration into the U.S.

[10] See Appendix Figure A1, which shows the time series of immigrants arriving to the U.S. from different Asian countries.

[11] These two groups had very different values, identities, and attachment to Japanese and American cultures (Spickard, 1996). While the Nisei where American citizens by birth, race-discriminating laws (in place until 1952) prevented Japanese resident aliens to be eligible for naturalization.

2016).[12]

On December 7, 1941, Japanese war planes attacked the naval base of Pearl Harbor, Hawaii, bringing the U.S. into WWII and turning the Issei into enemy aliens. Mixed with existing racially-motivated animosity, suspicion was quickly drawn towards the community of Japanese Americans in the West Coast and rumors of sabotage and espionage became widespread. The FBI carried out the first Government reaction by picking up and detaining Issei male community leaders.[13] However, there were yet no clear signs of what was to come. Even after Pearl Harbor, both Attorney General Biddle and President Roosevelt made statements in favor of personal freedoms and minority rights, explicitly calling for the rights of enemy aliens and warning against falling into war hysteria and minority persecutions (Leighton, 1950).

Despite these previous claims, on February 19, 1942, President Roosevelt signed Executive Order 9066, which would later on lay the ground for the mass internment of Japanese Americans.[14] This order gave the Secretary of War and designated military commanders the power to prescribe military areas from which any person could be excluded. However, it made no specific mention to Japanese Americans, mass internment, or the West Coast. Events escalated quickly from this point onwards. On February 23, a Japanese submarine fired at oil tanks near Santa Barbara, California, increasing the fear of an invasion and rumors and suspicion towards the Japanese American population. On March 2, the U.S. military divided the states of Washington, Oregon, California and Arizona into designated Military Areas 1 and 2, encouraging Japanese residents in Area 1 to move East.[15] After the failure of the voluntary migration scheme, on March 27 Japanese Americans in Area 1 (citizens and non-citizens alike) were prohibited from moving in preparation for the mass removal and incarceration that ensued.[16]

Shortly after, the army Western Command, claiming military necessity, started organizing the mass removal of over 110,000 Japanese Americans from the West Coast. Notices were posted in many cases with less than a week's notice before departure. Families were told to bring the essential things that they could carry, and there was complete uncertainty

[12]For example, Asians, as opposed to other immigrants, where not eligible for naturalization. The California Alien Land Law of 1913 prevented ownership of land by "aliens ineligible to citizenship" and restricted leases to these individuals to three years. Other laws restricted their access to employment, housing, and education. The Japanese and the Chinese would be collectively racialized as the "yellow peril" (Wu, 2013) and many organizations of politicians, intellectuals, and workers would actively defend their segregation and putting a stop to new arrivals.

[13]At this time many Italian and German individuals were also detained by the FBI. By mid-December 1,460 Issei had been taken into custody by the FBI. This number amounted to 1,221 Germans and 222 Italians (Japanese American National Museum, 2017).

[14]For a discussion on the actual reasons and the decision-making process behind the mass incarceration decision see Daniels (2000).

[15]Military Area 1 was comprised of the western half of Washington and Oregon, the southern half of Arizona and the western half of California from Oregon to Los Angeles as well as the area south of Los Angeles. Military Area 2 was comprised of the remaining areas of these states.

[16]Voluntary migration was not successful for several reasons. People were fearful of going to other states. Many officials had expressed their rejection to hosting them. Nevada Governor E.P. Carville threatened to place Japanese entering his state in concentration camps, while Kansas Governor Payne Ratner declared that Japanese were not wanted and not welcome in his state (Leighton, 1950). In addition, the military sent mixed signals. As late as March 7, Lt. General DeWitt reiterated that no mass "evacuation"—the term used at the time—was planned for the Japanese.

regarding if and when they would be able to come back. Many were forced to sell their property, furniture, and other belongings very quickly, at "fire sale" prices. After a short stay in temporary centers and beginning in the summer of 1942, Japanese Americans were sent to ten internment camps in remote and isolated parts of the country that the Government had hastily built. A civilian agency, the War Relocation Authority (WRA), was set up to administer the camps. They were distributed in California, Arizona, Idaho, Utah, Wyoming, Colorado and Arkansas.[17]

Life at the camps

The camps consisted of blocks of military-style tarpaper barracks, with communal mess halls and lavatories in the middle of each block (see Appendix Figure A3). While internees were provided with basic necessities (food, shelter, healthcare, and schooling for children), life at the camps entailed many hardships. Not only due to the loss of freedom, but also arising from poor living quarters and services.[18] In trying to overcome these adversities, internees strove to lead their lives as normally as possible. With the effort and labor of internees, these camps turned into communities that became rather self-sufficient in the provision of services and had a rich social life driven by internee-organized activities. Different types of assemblies were set up to organize camp affairs and represent the interest of different groups of internees. Some internees held jobs in the camps (maintenance, cooks, administrative clerks, teachers, hospital workers, food growers) although the wages paid by the WRA were very low.[19]

The economic and human capital composition of the camps was a diverse one. West Coast Japanese Americans in 1942 were represented in all strands of society; from highly educated city professionals, to small business owners, to itinerant farm laborers. This turned camp communities into a mix of people that, while sharing a same ethnic or national origin, were heterogeneous in economic terms.

Using administrative camp records on the population of internees, and recently-digitized 1940 Census population data with fine geographic identifiers, Table 2 provides new descriptive evidence on internees' previous communities of residence and internment camps. This table shows that most internees were surrounded by a higher share of highly-educated and highly-skilled individuals than in their former communities. For each of the 10 camps, Table 2 displays the fraction who had at least some college education (Column 3), the fraction with professional or managerial occupation skills (Column 5), and the fraction with white collar occupation skills (Column 7). Using 1940 Census data, Columns 4, 6, and 8 show what fraction of West Coast Japanese Americans were living in neighborhoods with a lower share of each of the corresponding groups of people.[20] For example, focusing on ed-

[17] Appendix Figure A2 displays a map with the location of the 10 camps.

[18] Historical accounts are filled with mentions to the low quality of meals and medical services. Saavedra (2015) documents the bad conditions in camp schools.

[19] Initially a wage scale of $12, $16 and $19 per month was put in place ($174, $232 and $275 in 2017 dollars approximately). The $12 wage was later abandoned, $16 became general, and workers whose job was seen as specially important, such as hospital workers, were paid the $19 wage (Spicer et al., 1969).

[20] I define neighborhoods in 1940 Census data as groups of Census enumeration districts within a county,

ucation and on Heart Mountain camp, Column 3 shows that 12.7% of their adult internees had at least some college education. Column 4 reflects that 61.8% of West Coast Japanese Americans were living in 1940 in neighborhoods with a share of college educated people *below* 12.7%. Looking at these quantiles across measures and camps, we see that they usually reflect high values, mostly over 0.5. This indicates that the shares of highly educated and skilled workers in the camps were larger than that in the previous communities of most internees.[21]

Through communal mess hall and lavatories, assemblies, leisure activities, and organization to keep the camps running, internees came in close and constant contact with their camp neighbors. The diversity of individuals at the camp level was also present at the much finer level of the block, which was an important social and organizational unit within each camp. The people internees saw several times a day, lived with in very close physical proximity, and shared mess halls and lavatories with, were very different from the ones they had known and interacted with in their previous lives.[22] As Spicer et al. (1969) put it:

> *Everyone was faced with more new than familiar persons in the unaccustomed intimacy of the imposed block basis of social life. Moreover these strangers faced one another in wholly new roles, as chefs and workers in the mess halls as well as table companions, as block managers entirely outside the Japanese-American experience, and in a host of other roles required in the organization of center life* (p14).

> *[...], the people in any one block constituted a heterogeneous assortment. Although it might consist of 300 persons from Los Angeles, or Santa Clara County, of Fresno, or Seattle, and although it might consist of a dozen groups of families, each group of whom had known each other before evacuation, still the dozen circles of friends often had very little in common. A typical block of country people might contain eight to ten families of well-to-do farmers, fifteen or twenty itinerant farm laborers, a dozen or more families of poor tenant farmers, a few small-town shopkeepers, possibly a dentist and his family-people who had lived according to widely different economic standards, who had gone to different churches, and who perhaps belonged to none of the same organizations. No block had from the beginning a background of common participation of all its members in some former community* (p103).

A relevant way in which the interactions between people of diverse skills were channeled was through the adult education programs present in the camps, which are well doc-

such that the average neighborhood size is around 10,000 people, the same number as in camp populations. I focus on such neighborhoods in Washington, Oregon, California, and Arizona where at least one Japanese person was living in 1940. Calculations with respect to these neighborhoods are weighted by the number of Japanese people in each of them.

[21] Appendix Table A1 repeats the analysis but only considering the economic composition of other Japanese Americans in the previous neighborhoods. The conclusions when using this alternative neighborhood definition is unchanged.

[22] This environment could have been propitious for people to find out about what different Japanese Americans did professionally, gather information, and potentially envision new things to do after camp. There is at least some anecdotal evidence of this. In 1955, the Saturday Evening Post ran a story about Californian Japanese Americans and their readjustment to normal life (Bess, 1955). It mentioned the story of a man named Victor Ikeda:

> *Victor Ikeda, now head of his own prosperous insurance agency, was working in Li'l' Tokyo as a vegetable broker when he was thrust into a camp with his family and kept there for three years. [...] While Mr. Ikeda was in camp he decided to sell insurance after the war, and occupied many leisure hours practicing upon prospects who were not then in a position to buy anything.*

umented by Su (2011). These programs were internee-operated, taught by those internees who had relevant prior professional or academic skills to share. The availability of time, the fact that they were internee-driven and operated, and internees' desire to prepare for their lives after internment made these programs very popular. The course offerings were varied, including English (for the Issei), shorthand, typing, bookkeeping, mathematics, and business.[23]

Leaving camp

Individuals started to gradually leave the camps in the winter of 1943-1944. They were not yet allowed to return to the West Coast, but after receiving approval, they could leave and resettle in other parts of the country. The WRA tried to encourage and help these moves by setting up field offices in different cities to help internees resettle and find jobs. Cities close to the restricted area such as Salt Lake City or Denver were popular destinations, although many ended up leaving for farther away places such as Chicago, Milwaukee or Atlanta. The beginning of the end of internment came from the courts. The Supreme Court ruled in December 1944 (*Ex parte Mitsuye Endo*) that the retention of loyal citizens in internment camps was unconstitutional.[24] At the same time, the Government announced that by January 1945 the exclusion order would be rescinded, Japanese Americans would be allowed to return to the West Coast, and a timeline for the closing of the camps was put in place.

In the fall of 1945, more than three years after leaving the West Coast, the majority of internees had left the camps (Tule Lake camp closed in 1946).[25] Many returned to their places of origin to pick up their former lives, while others looked to establish themselves elsewhere. Initial destinations outside the West Coast were rarely definitive, and a migratory movement was set in motion where thousands of people looked for new beginnings around the country, leaving the internment experience behind. Around 40% of former internees initially resettled outside the West Coast.[26] Between four- and five-thousand former internees (out of which 40% were minors) migrated to Japan after internment (Daniels, 2004).[27]

[23] Although they are not the object of this study, it should be mentioned that evidence suggests that school-aged internees, as opposed to adults, had worse educational opportunities in the camps that what they would have experienced outside (Saavedra, 2015).

[24] The Supreme Court had two other rulings with respect to the mass internment of Japanese Americans. *Korematsu v. United States* declared also in 1944 that the exclusion order was constitutional. In 1943, *Hirabayashi v. United States* held that the curfews imposed on Japanese Americans prior to internment were constitutional.

[25] It is worth mentioning that Nisei—interned and non-interned—fought in the US armed forces during WWII. The 442nd Infantry Regiment was composed almost entirely of Nisei and it is the most decorated unit in U.S. military history. In the survey data described below, interned and non-interned Japanese Americans were roughly equally likely to report serving during WWII. 31% of non-interned Nisei respondents served while the corresponding number for the interned is 27%.

[26] In 1980 the U.S. Congress appointed the Commission on Wartime Relocation and Internment of Civilians. Their conclusions were that mass internment had constituted a "grave injustice", that incarceration was not justified by military necessity but based on "race prejudice, war hysteria, and a failure of political leadership." In 1990, camp survivors were given $20,000 as compensation, along with an apology letter from President Bush.

[27] In Appendix C I discuss potential implications for my empirical analysis of migration to Japan. Migration to Canada seems unlikely. Canada forcibly removed and interned its Japanese population from British Columbia, not allowing them to return until 1949.

3 Data

I use three main sources of data. Firstly, the U.S. Census for the years 1940, 1950, and 1960. Secondly, the Japanese American Research Project (JARP), a 1960s survey of Japanese Americans and their descendants. Lastly, the War Relocation Authority (WRA) records, a comprehensive list with information on every individual who was interned in each of the ten internment camps.

Decennial Census 1940-1960

I use the 1940 full count, 1950 1% sample, and 1960 5% sample of the Decennial Census made available by IPUMS (Ruggles et al., 2015). These provide three cross-sections of Japanese and Chinese Americans before and after the internment episode. The key relevant variables in the Census are those providing information on race, income, and current place of residence. The 1940 Census provides some but incomplete information on non-wage income, so I use a simple imputation procedure for non-wage income in this census year.[28] My difference-in-differences strategy using Census data focuses on the 1896-1924 birth cohorts of male individuals of Japanese or Chinese race.

Two key features of Census data motivate much of my empirical approach. The first is that internment status (future or past) is unobserved. Second is the lack of panel linkages between the three datasets. These two characteristics, together with the large geographical dispersion of internees across the U.S. after leaving the camps, makes determining internment status based solely on Census information unfeasible. While the combination of race and current state of residence would be an almost perfect determinant of internment status *in 1942*, this is certainly not the case in 1950 or 1960. I overcome this issue by developing a method that combines Census data with survey data and administrative camp records. As I explain in Section 4, this allows me to predict internment status based on Census observables while taking into account the characteristics of the population of internees and their migration patterns after internment.[29]

Table 1 presents summary statistics on the Census sample, separately for Japanese and Chinese in the relevant states and birth cohorts. Given the very low number of Japanese and Chinese Americans in the 1950 1% sample, I group 1950 and 1960 as a single "post" period in most of the empirical analysis.[30] Compared to the Japanese, the Chinese were somewhat older and more likely to have been born abroad. Likely in part because of this, they had a lower educational attainment. Due to these differences, I control for these covariates in the

[28] The outcome variable in the DiD analysis is total annual income. While this is readily available in the 1950 and 1960 Censuses, the 1940 Census only asked for wage income and whether non-wage income was above or below $50. I impute non-wage income in the 1940 Census using non-wage income in 1950 and 1960. To do so I group individuals in 1,680 cells based on 5 wage income groups, whether non wage income is above or below $50, 12 occupation groups, 7 age groups, and a year-round work dummy. I compute median non-wage income in 1950-60 (using Japanese, Chinese, and native whites) in each of these cells. I use this to merge non-wage income at the cell level in 1940. Finally, I winsorize total income at the 1st and 99th percentiles.

[29] A potential concern emanating from the lack of panel data is the stability of the sample. See Appendix C for a discussion.

[30] As a robustness test I check that the results hold when using only 1940 and 1960 data.

DiD analysis. Finally, the table shows how average income across the two groups was very similar in 1940.

Japanese American Research Project surveys

The Japanese American Research Project (JARP) was initiated in 1960 by the Japanese American Citizens League (JACL). Its objectives included conducting a sociological survey of Japanese Americans, as well as collecting objects, documents and oral history from the community (Niiya, 2017). The JACL partnered with the University of California Los Angeles to conduct the survey and store the collected materials. By 1967, survey data on a total of 4,153 Japanese Americans of three different generations had been collected. Levine and Rhodes (1981) describe the survey in detail.

A list of around 18,000 surviving Issei (1st generation Japanese American) in the continental U.S. was compiled with the help of Japanese American associations and local authorities. This list aimed at being as comprehensive as possible. A sample of them was selected to be interviewed and between 1963 and 1966 a total of 1,047 Issei were interviewed.[31] Issei respondents were asked to provide a list of their Nisei children. This provided a list of 3,817 Nisei who were contacted for in-person, mail, or telephone interviews. With a response rate of 60 percent, a total of 2,304 Nisei were interviewed. In the same way as their parents, they provided the contact details of their (adult) children. This provided a total of 1,063 adult Sansei (third generation Japanese American) of whom 802 (75 percent) responded to a mail questionnaire. Nisei and Sansei survey data was collected between 1966 and 1967.[32] [33]

I focus on the Issei and Nisei questionnaires since the Sansei were either not born or very young during internment. Questionnaires were exhaustive and questions ranged many different topics. Surveys were different for each generation. Topics included work and occupations, migration from Japan and within the U.S., attitudes, network of relationships, beliefs, and expectations for the future. Importantly for my purposes, many questions were asked in a retrospective way providing some panel data. Also, respondents were asked about their internment status between 1942 and 1945. Regrettably, JARP did not ask about income retrospectively.

The JARP surveys are relevant in two different roles. First, they will allow me to take into account migration patterns when predicting internment status in the Census. Second, I will explore mechanisms behind the long-term income result by comparing career trajectories and attitudes of interned versus non-interned JARP respondents. Tables 3 (Issei) and 4 (Nisei) present summary statistics on the main JARP baseline variables of interest, separately for interned and non-interned respondents.

[31] According to Levine and Rhodes (1981) less than 1 percent of those initially sampled refused to participate. These were interviews based on the family as a unit. Whenever the male member of the marriage was still alive, he was the one who was interviewed.

[32] The microdata from the three surveys are currently available online through the Inter-university Consortium for Political and Social Research (ICPSR) at the University of Michigan (Levine, 2006).

[33] Levine and Rhodes (1981) argue that the representativeness of the JARP survey was good. For more information on representativeness, please see Appendix B.

War Relocation Authority records

The third dataset I use in this paper comes directly from the internment camps. It contains information on every individual who was interned in each of the ten WRA camps, and it was recorded by WRA employees at the time people arrived to the camps. A digitized version of the original records is made available online through the National Archives.

The dataset has information on 109,247 people. Information about each internee includes their name, internment camp, previous address, educational attainment, occupational skills, and birthplace, among other social and demographic characteristics. Figure 1 shows the state of origin of the population of internees, compared with the state of origin of individuals of Japanese race in the 1940 Census. Figure 2 shows the distribution of occupations, educational attainment, and urban/rural origin at the camp level and overall.

4 Empirical Approach

I now describe the empirical approach I follow to estimate the long-run effect of internment on income. I first describe the difference-in-differences (DiD) framework *as if* internment status were observed. I then show how I get around missing internment information in the Census by combining different datasets and estimating the probability of internment conditional on observables.

Difference-in-Differences framework

The objective is to estimate the effect of internment on income using repeated cross-sections from the Census. The 1940 Census provides information before internment, while the 1950 and 1960 Censuses provide information 5 and 15 years after the last individuals left the camps. Hence, the estimated effects on earnings should be interpreted as long-term, and not as the immediate labor market conditions faced by internees once they left the camps. I focus on males, born between 1896-1924 (people in working age both before and after internment).

The empirical DiD model based on observed internment has the following form:

$$y_{it} = \alpha_t + X'_{it}\gamma + \delta I_i + \beta(I_i \times Post_t) + \varepsilon_{it} \tag{1}$$

Where y_{it} is annual income for individual i in Census year t, α_t are time fixed effects for each of the three Census years, X_{it} are time-varying controls, I_i equals one if individual i was interned, and $Post_t$ equals one for Census years 1950 and 1960.[34] Using a suitable comparison group, the assumptions of parallel trends and zero conditional mean of ε_{it} are satisfied and β is equal to the average effect of internment for internees.

[34] At baseline X_{it} will include functions of age and birthplace. Alternative specifications also include educational attainment and current place of residence. Due to the small sample size of the 1950 Census 1% sample, I am not able to estimate β separately for 1950 and 1960. It can thus be interpreted as an average effect 5 and 15 years after internment. As a robustness test, I provide DiD results using only 1940 and 1960 data.

When choosing a suitable comparison group it is key to account for the institutionalized discrimination towards Asians before WWII—especially in the West Coast—and its decline thereafter (Hilger, 2016). Comparing interned Japanese Americans with groups who did not experience the same shift in racial discrimination could confound the effect of internment with these trends. The control group I employ is a combination of non-interned Japanese Americans (those living outside the West Coast when internment took place) and Chinese Americans from the West Coast (Washington, Oregon, California and Arizona—the states targeted for mass internment). The former shared with internees a common country of origin and migratory background but were not interned because in 1942 they were residing in areas other than the West Coast. The latter, while being the target of the same anti-Asian discrimination prevalent in the West Coast before WWII and living in the same areas, were not targeted by government authorities because China, as opposed to Japan, was a U.S. ally during WWII. Given these different similarities, I believe that these two sub-groups complement each other nicely in creating a suitable control group for internees.[35]

I provide some evidence to examine the plausibility of non-interned Japanese and Chinese being a suitable control group. Outcome variable trends prior to treatment are usually examined as indication of the validity of the parallel trends assumption. Such a check is not available since the 1940 Census was the first to record income information. However, I examine trends for the occupational income score, an income proxy available in both the 1930 and 1940 Censuses.[36] Appendix Figure A4 shows the average occupational income score between likely interned Japanese Americans, likely not interned Japanese Americans, and West Coast Chinese Americans (see the following section for a definition of the estimated probability of internment). Caution should be taken when interpreting this figure since there are only two data points and it represents an imperfect measure of my outcome variable.[37] However, it is somewhat reassuring to see that the 1930-1940 trend is parallel between the three groups.

Similarity of pre-treatment characteristics, though not necessary for the DiD assumptions to hold, is a desirable feature in such a setting. Appendix Figures A5 and A6 provide some insight into the similarity of labor market characteristics of both groups in 1940. Appendix Figure A5 plots the distribution and average (vertical lines) of income after conditioning on place of birth, age, and high school completion (covariates in equation (1)) for both groups in 1940. The average is the same across both groups and the distributions show significant overlap. Appendix Figure A6 plots the occupational distribution for both groups in 1940. While the probability of working in farming or being a laborer varied substantially between internees and non-internees, the remaining occupations were held in similar pro-

[35]Between 1940 and 1960 the vast majority of Asian immigrants in the U.S. were from China or Japan (see Appendix Figure A1). The peak decade of Chinese immigration took place in 1871-80, whilst the corresponding one for Japan happened in 1901-10.

[36]This measure of income is solely based on occupation. It assigns each occupation the median total income of all persons with that particular occupation in the 1950 Census. See variable OCCSCORE in Ruggles et al. (2015) Measures of income using statistics of the distribution of income across occupations are common in historical in settings where individual earnings were not recorded. See, for instance, Abramitzky et al. (2014).

[37]In this case, where the persons of study belong to a discriminated racial minority, occupational income scores statistics—based on the median worker in each occupation—should be interpreted with extra caution.

portions.[38]

A potential concern is the existence of differential trends in post-war racial discrimination towards Chinese and Japanese Americans that could confound the effects of internment. The historical literature does not suggest such a large distinction, and it has studied the change in anti-Asian discrimination of these two groups as a whole (e.g. Wu, 2013; Hilger, 2016). An important historical asymmetry, if anything, favored the Chinese; they were first allowed to naturalize in 1943 while Japan-born residents were only allowed to do so in 1952. It was not until the 1980s that the injustice towards internees was formally acknowledged and compensated. Finally, DiD regressions using only Japanese as comparison group should help allay these concerns.

Overall, the historical context and the empirical evidence from the 1930 and 1940 Censuses suggest that the required DiD assumptions are reasonable in this setting. In Section 6 I provide additional evidence regarding the pre-internment similarity of interned and non-interned Japanese Americans in the JARP surveys. Next, I deal with the fact that I_i is actually not observed in the Census.

Predicting unobserved internment status

Census data do not include internment status information. This prevents me from estimating equation (1). The nature of the data (no panel data) and the historical context (migration after internment) pose additional challenges to inferring the value of I_i from Census observables.

Given how Japanese American internment took place, the combination of a person's race and state of residence *in 1942* would be a very good predictor of I_i.[39] This means that—absent large migration flows between 1940–1942—it is relatively straightforward to predict internment for 1940 Census observations. It would also be straightforward to predict internment in 1950 and 1960 if panel data were available and thus state of residence *in 1940* was observed in 1950 and 1960. This is not the case since I am relying on repeated cross-sections that do not record place of residence ten and twenty years before. The large migration of internees to states away from the West Coast after internment complicates matters, since state of residence in 1950 and 1960 is not a good proxy for state of residence in 1940.

I address these issues by bringing in two additional datasets that complement Census information: the JARP surveys and the WRA internee files. The goal is to extract different information from each one of them in order to be able to estimate an individual's probability of internment based on Census observables. To be more precise, the goal is to estimate $Pr(I_i = 1|Z_i, s_i^t) \equiv \mathbf{E}[I_i|Z_i, s_i^t]$, where Z_i are immutable characteristics of individual i observable in the Census (year of birth, birthplace, race) and s_i^t is the state of residence of person i in Census year t, for $t = 1940, 1950, 1960$. Given the historical context of Japanese

[38] Unfortunately, the lack of panel data prevents me from controlling for occupation prior to internment. I specifically focus on JARP survey farmers in Section 6.

[39] Race (with different categories for persons of Chinese and Japanese origin) is observed throughout the 1940-1960 Censuses.

American Internment, I assign $\hat{\mathbf{E}}[I_i|Z_i, s_i^t] = 0$ for individuals whose race is recorded as Chinese in the Census. The following discussion applies for individuals of Japanese origin.

Estimation of $\mathbf{E}[I_i|Z_i, s_i^t]$

In 1940 Census

I start by estimating $\mathbf{E}[I_i|Z_i, s_i^{40}]$, the probability of internment based on state of residence in 1940. Applying Bayes' rule,

$$Pr(I_i = 1|Z_i, s_i^{40}) = \frac{Pr(Z_i, s_i^{40}|I_i = 1) \cdot Pr(I_i = 1)}{Pr(Z_i, s_i^{40})} \tag{2}$$

I take advantage from the WRA records, where I observe all individuals that *were* interned along with several individual characteristics (which include Z_i and s_i^{40}).[40] Together with the 1940 Census, where I observe all individuals of Japanese origin *who were or were not interned*, I can nonparametrically estimate each of the three pieces in the right-hand side of equation (2).

Grouping individuals in cells according to $Z_i \times s_i^{40}$, $Pr(Z_i, s_i^{40}|I_i = 1)$ is estimated as the proportion of individuals in the WRA records in each $Z_i \times s_i^{40}$ cell. The unconditional probability of internment, $Pr(I_i = 1)$, is estimated as the total number of individuals in the WRA records over the total number of individuals in the 1940 Census reporting to be of Japanese race. Finally, $Pr(Z_i, s_i^{40})$ is estimated using the 1940 Census by computing the proportion of Japanese Americans in each $Z_i \times s_i^{40}$ cell.

This procedure provides $\hat{Pr}(I_i = 1|Z_i, s_i^{40})$, a nonparametric estimate of the probability of internment based on observables Z_i and state of residence in 1940. This allows me to attach a probability of internment for each individual of Japanese origin in the 1940 Census.

In 1950 and 1960 Censuses

Since the WRA records do not include state of residence in 1950 and 1960, the same procedure cannot be carried out for these Census years. The key to estimating the probability of internment for these years is the JARP data. The JARP asked respondents retrospective information regarding their internal migration within the U.S. Thus, in the JARP dataset I observe for each individual their state of residence in 1940, 1950, and 1960. This allows me to estimate a state-state matrix of migration probabilities for Japanese Americans and, in combination with $\hat{Pr}(I_i = 1|Z_i, s_i^{40})$, estimate $\hat{Pr}(I_i = 1|Z_i, s_i^{50})$ and $\hat{Pr}(I_i = 1|Z_i, s_i^{60})$.

I begin by making the assumption that *conditional on state of residence in 1940*, state of residence in 1950 and 1960 does not impact the probability of internment. That is, I assume

$$\mathbf{E}(I_i|Z_i, s_i^{40}, s_i^t) = \mathbf{E}(I_i|Z_i, s_i^{40}), \quad t = 1950, 1960$$

Given the historical context, in which internment was based solely on race and state

[40] I assume throughout that individuals' state of residence in the 1940 Census was the same one as the one they were residing in 1942 at the time of internment.

of residence, the above assumption is credible. Under this assumption, one can use the estimated probabilities for the 1940 Census and integrate out s_i^{40},

$$\mathbf{E}(I_i|Z_i, s_i^t) = \sum_{s=1}^{S} \mathbf{E}(I_i|Z_i, s_i^{40} = s) \cdot Pr(s_i^{40} = s|Z_i, s_i^t) \tag{3}$$

where $Pr(s_i^{40} = s|Z_i, s_i^t)$ is an entry in the migration matrix which is estimated using JARP.[41]

In short, equation (2) shows how one can use a combination of the 1940 Census and the WRA records to estimate the probability of internment in 1940. Equation (3) adapts this predictor for 1950 and 1960, using migration information contained in JARP. I now show some characteristics of the estimator $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$.

Descriptives and performance of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$

Figure 3 shows the distribution of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$ for Japanese individuals in different Census years, residing in California, Illinois and Utah.[42] I have also estimated probabilities for the 1930 Census year for illustration purposes following the same procedure as for 1950 and 1960. These three different states are chosen because they represent different historical evolutions with respect to Japanese American migration and internment. California was the state with the largest population of persons of Japanese origin. Its residents were also targeted for internment by the U.S. government. Hence, in any given Census year, a Japanese residing in California has a high chance of having been/going to be interned, which is what Figure 3 shows. Illinois represents a different scenario. It had practically no residents of Japanese origin before internment. However, after internment a very significant number of former internees resettled in Chicago. This means that in 1950 and 1960, a Japanese residing in Illinois would have a high probability of being a former internee. Finally, Utah is an in-between case. There was a significant—though small—community of Japanese residing in Utah before 1942, but it was not targeted for internment. Because of this, a Japanese living in Utah in 1930 has a small but positive probability of going to be interned, allowing for the possibility that between 1930 and 1940 he migrated to the West Coast. In 1940, Japanese from Utah have no probability of being interned since it was not targeted by the U.S. government. Finally, in 1950 and 1960 the probability is positive to allow for those that migrated to Utah after having been interned.

Given that the JARP recorded respondents' past internment status, I can use it to perform a sanity check of my estimate of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$. I compute the probability of internment for each individual-year in the JARP dataset and I compare it to *actual* internment. Figure 4 is a binned scatterplot of actual versus predicted internment together with the 45 degree line. The points align pretty closely to the 45 degree line, suggesting that my estimate does a good job at predicting internment.

The JARP dataset also allows me to compare the performance of my predictor $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$

[41] In the empirical implementation and due to data limitations, I estimate a common migration matrix for all values of Z_i. That is, I assume that $Pr(s_i^{40} = s|Z_i, s_i^t) = Pr(s_i^{40} = s|s_i^t)\ \forall Z_i$.

[42] Appendix Figure A7 shows maps with the mean probability of internment for each state and year.

with the performance of a simpler predictor solely based on place of birth. Suppose we define a predictor $\tilde{I}_i$ which assigns probability of internment equal to 1 if a Japanese American was born in the West Coast and 0 if born in the rest of the US, while being undefined for those born in Japan (this is similar to the approach carried out in Chin (2005)). Using JARP I compute that, among the US-born, the mean squared error (MSE) of $\tilde{I}_i$ is equal to 0.172 while the MSE of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$ is equal to 0.145. Thus, the drawbacks from using $\tilde{I}_i$ instead of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$ would be i) not being able to consider those born in Japan (around 35% of internees), and ii) a MSE which is 18.6% higher.

Estimation and interpretation of coefficients

Equipped with $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$, I now discuss how this allows me to estimate the effect of internment on income, the required assumptions, and the interpretation of the estimated parameter. Going back to equation (1) and taking conditional expectations,

$$\mathbf{E}[y_{it}|Z_i, s_i^t] = \alpha_t + X_{it}'\gamma + \delta\mathbf{E}[I_i|Z_i, s_i^t] + \beta(\mathbf{E}[I_i|Z_i, s_i^t] \times Post_t) \tag{4}$$

under the assumption that $\mathbf{E}[\varepsilon_{it}|Z_i, s_i^t] = 0$. Using the estimated probabilities, β can be estimated from the following DiD regression:

$$y_{it} = \alpha_t + X_{it}'\gamma + \delta\hat{\mathbf{E}}[I_i|Z_i, s_i^t] + \beta(\hat{\mathbf{E}}[I_i|Z_i, s_i^t] \times Post_t) + u_{it}. \tag{5}$$

Some remarks are in order. For equation (4) to hold, X_i is required to be a subset of Z_i. This is indeed the case as Z_i contains the same information as X_i plus race. In this sense, estimating β through equation (5) is similar in spirit to an instrumental variables procedure in which I_i is the endogenous variable and race and state of residence are the excluded instruments. In this case I am not using fitted values of I_i due to endogeneity concerns, but because I_i is unobserved in my main dataset.[43]

Another necessary assumption for this procedure to work is that race and state of residence are indeed excluded instruments, and only affect income through the probability of internment. Since both Japanese and Chinese Americans suffered the same type of pre-War discrimination towards Asians, it is plausible to assume that race has no direct effect on income other than through internment.[44] Current state of residence as an excluded instrument might be more problematic if there are premiums to residing in one state or another. To address this concern, I estimate versions of equation (5) in which X_{it} includes fixed effects for 5 geographical partitions of the U.S.[45] This specification allows for time-invariant location premia, making the new required assumption that before-after *changes* in location premia only affect income through internment probability.

[43] In this spirit, the estimation of equation (5) is related to two-sample IV methods (Angrist and Krueger, 1992), where the IV first stage is estimated with one dataset and the second stage with another one. I compute my fitted values of I_i by combining not two, but three different datasets.

[44] In fact, historical accounts claim that to the eyes of many white Americans the Japanese were indistinguishable from the Chinese (Higgs, 1978) and were collectively racialized as the "yellow peril" (Wu, 2013).

[45] The five partitions correspond to the four Census regions (Northeast, South, Midwest, West), subdividing the Western region into the two divisions that compose it - Mountain and Pacific.

Under the maintained assumptions, the parameter β can be interpreted as the average treatment effect on the treated thanks to one-sided non-compliance. Since Chinese individuals are interned with zero probability, there are no "always-takers" so that the population of treated and compliers are identical (Imbens and Angrist, 1994).

5 Long-Term Impact of Internment on Income

Figure 5 plots raw income averages for likely internees (using the estimated probability of internment) and different control groups, before and after internment. Internees had similar levels of annual income, around $2,000-$2,500, as non-interned Japanese and West Coast Chinese in 1940. However, the figure shows how internees experienced a higher income growth between 1940 and 1950-60 than any of the three control group combinations. I next see whether this patterns hold in a DiD regression framework with different sets of controls.

Table 5 shows the results from estimating different specifications of equation (5). I show estimates of β for different choices of control group and different X_{it} regressors. Columns labeled 1 include as control group non-interned Japanese and Chinese from the West Coast. In columns 2, I exclude Japanese individuals with zero predicted probability of internment. Columns 3 exclude all Chinese individuals and only use non-interned Japanese as control group.[46] I report bootstrap standard errors throughout. These are computed bootstrapping the whole procedure—estimation of $\hat{\mathbf{E}}[I_i|Z_i, s_i^t]$ followed by DiD regressions—and take into account the sampling error of my generated regressor.

Panel A shows estimates of β for the baseline specification, where X_{it} includes a quadratic in age and birthplace dummies.[47] Estimates of the effect of internment on income range from $476.03 when only using the Japanese as comparison group, to $563.92 when using both Chinese and non-interned Japanese. This translates to increases in annual income of between 12.2% and 14.8% (with respect to the counterfactual average income implied by $\hat{\beta}$). Coefficients are significant at regular confidence levels except for the specification that excludes the Chinese. The relatively small number of non-interned Japanese makes this estimate noisy and non-significant, but similar in magnitude to the more precisely estimated ones that include the Chinese. This feature is common across the four panels.

Panel B adds education to the set of controls, in the form of a dummy variable that equals one if a respondent has a high school diploma.[48] In this panel and other specifications controlling for education I exclude the youngest set of cohorts, those born between 1920 and 1924. I do so in case internment affected education decisions for these younger cohorts, so as to not control for an endogenous outcome. The estimated effects of internment are somewhat larger than in the baseline, ranging from $540.04 (15% increase) when excluding

[46] See Appendix Table A2 for equivalent results when only using 1940 and 1960 data.

[47] I include separate dummies for four birthplace categories: West Coast states (CA, WA, OR, and AZ), the rest of continental U.S., country of origin (Japan for Japanese, China for Chinese), and everywhere else.

[48] When education is included in X_{it} it also needs to be included in Z_i. For regressions controlling for education I re-estimate $\mathbf{E}[I_i|Z_i, s_i^t]$ including education in the set of predictors. This turns out not to make a big difference, and the correlation between the two predicted internment values is 0.97.

the Chinese to $764.63 (22% increase) when using the full sample.

Panel C includes current location of residence controls, in the form of fixed effects for the 5 geographical partitions described in the previous section. Under this specification, the estimates of the effect of internment on income are still positive and significant, although smaller in magnitude than the previous one. The effect ranges now between $353.34 (8.8% increase) to $403.74 (10.2% increase), depending on which control group is used.

Panel D specifications include both education and location controls. The estimated effects in this case range in between the ones obtained on panels B and C. They range from $489.85 (13.4% increase) when excluding Chinese to $616.97 (17.4% increase) when using the whole sample. In the same way as in the previous panels, these two estimates are significant at the usual levels while the estimate that excludes the Chinese is not.

The graphical and DiD results imply that internment led individuals to, on average, generate higher incomes in the long term. This finding is robust to a range of different specifications that vary both the choice of the control group as well as the set of controls used in the regressions. The estimated effects on income are economically meaningful, with the more conservative ones implying an average increase in annual income with respect to the counterfactual of about 9%.[49]

Additional robustness checks

In Appendix C I study the sensitivity of the estimated effects to "worst-case" scenarios of negatively-selected migration to Japan. I do this combining historical accounts on the number of people who left with an empirical "worst-case" exercise in the spirit of Lee (2009) and Horowitz and Manski (2000). I add "placebo" internee observations to the *post* period with very low income realizations, and check DiD estimates under these conditions. The results of this exercise are positive effects even under very conservative (and arguably implausible) assumptions. Thus, the estimated long-term positive income effects of internment are unlikely to be driven by negatively selected migrants to Japan.

Finally, in Appendix Table A4 I show that there is no evidence of internment leading to endogenous selection into the DiD sample (through labor force participation).

6 Mechanisms

Migration and Occupational Change

When forcibly leaving the West Coast, internees lost previous jobs and assets and were displaced to locations in many cases very far away from their homes. When leaving the camps, this forced many internees to reassess location and occupational choices starting

[49] Appendix Table A3 replicates Table 5 using log total annual income as dependent variable instead of the level. The results are quantitatively similar although more dispersed across specification, and with noisier estimates. Note that satisfying the parallel trends assumption in levels (as suggested by Appendix Figure A4, and the parallel trends between likely not interned Japanese Americans and Chinese Americans in Figure 5) implies that it will not be satisfied in logs. However, the fact that the general result holds in both specifications is reassuring.

from scratch. It is plausible that, due to labor market and migration frictions, many Japanese Americans' previous locations and jobs were not those maximizing their long-run labor market outcomes.[50] Because internees were forced to start over after internment, they may have migrated to areas and occupations where opportunities were greater for them.[51] This could have happened, even after a negative wealth shock, due to the presence of adjustment costs, or previous lack of information about outside opportunities.[52]

In fact, historical accounts from the internment camps already suggest this type of mechanism. A contemporaneous report (Okubo et al., 1943) citing a survey carried out in Granada camp states:

> *Of this sample [...], 51% stated that they intended to continue their previous occupation, while almost as many (47.5%) indicated that they wanted to adopt an entirely new occupation. [...] Apparently any changes made will be major changes into new and untried occupations widely different from former work. This is partly due to the war-time economy, no doubt, but it also reflects the desire of persons long frustrated in their efforts to enter certain occupations (particularly skilled and semi-skilled ones) which they have been barred from entering by social barriers in the West Coast states* (p. 30).

I analyze location and occupational transitions of internees before and after internment, comparing them to those of non-interned Japanese Americans. I do so by taking advantage of the longitudinal aspect of some JARP survey questions, and the fact that internment status is observed in the JARP dataset.

First, I check the comparability of the two groups before internment took place. Table 3 shows that interned and not interned Issei were equally likely to be female, had the same age, arrived to the U.S. at the same time, had the same amount of education in Japan and the U.S. and were equally likely to own their place of residence. As expected, their propensity to live in different parts of the country was different, and interned Issei were more likely to live in a Japanese neighborhood (most likely due to the fact that Japanese Americans were more numerous in the states targeted for internment).

Table 4 shows similar facts for the Nisei. Interned and not interned Nisei were equally likely to be female, had similar ages, educational attainment, and likelihood of living in a Japanese neighborhood. They were equally likely to be in farming, professional and technical or craft occupations. Some small differences do arise in the Nisei occupational distributions. Interned Nisei were somewhat more likely to hold managerial and clerical occupations, while non-interned Nisei were more likely to work as laborers or service occupations.

Tables 3 and 4 show that, although living in different parts of the country, interned

[50] By way of an example, discriminatory laws in place in the West Coast before the War prohibited Issei from owning land in their name. A common way of getting around this issue was to buy property in the name of their American-born children. This led many first-generation Japanese Americans to significantly rely on their children in order to conduct business (Spicer et al., 1969). It is reasonable to think that this imposed additional barriers and elevated the cost of Nisei leaving their place of origin in search of opportunity.

[51] Shoag and Carollo (2016) show that place effects impacted the relative fortunes of internees.

[52] This would not be the first instance in which a shock forcing individuals to move against their will leads them to re-optimize in a way that improves labor market outcomes; this has been recently shown in settings where a forced move is driven by an Icelandic volcano (Nakamura et al., 2019), Soviet annexation of parts of Finland (Sarvimäki et al., 2019), or Hurricane Katrina (Sacerdote, 2012; Deryugina et al., 2018).

and non-interned Japanese Americans were comparable at baseline. As such, it seems a reasonable assumption to attribute differential migration or occupational mobility patterns to the very big shock that the internment episode represented.

The top-left panel of Figure 6 shows that around 42 percent of non-interned Nisei held different occupations before and after WWII. This number is equal to 50 percent for interned respondents and this difference is significant at the 95% level. Among Japanese Americans, those who were interned were more likely to hold a new occupation after WWII than those who were not interned.

Many Nisei were farmers or farm laborers before internment (see Table 4). Once we break down overall occupational change based on baseline occupation, differential occupation switching is driven by those who were farmers before internment. The bottom-left panel of Figure 6 shows that while non-farmers were equally likely to change occupation (between 51-52 percent of them did), interned farmers were much more likely to hold a different occupation after internment than their non-interned counterparts (42 vs. 30 percent).

So what were these ex-farmers doing after internment? Did they move up the occupational ladder or did they transition to low-skill occupations? The bottom-right panel of Figure 6 shows that the answer to this question is very different for ex-farmers who were interned and those that were not. Those farmers who were interned and changed occupation were much more likely to switch to professional and technical or clerical occupations, while former non-interned farmers were much more likely to transition to working as laborers or in service occupations.[53]

I next turn to examine cross-state migration. The top-right panel of Figure 6 plots the proportion of JARP respondents who lived in different states before and after internment, by internment status. Internees were more likely to have migrated to another state (31% versus 25 % of non-internees). Note that this does not capture temporary moves right after internment, since the survey questionnaire asked for *main* state of residence between 1946 and 1952. In Appendix D I show that the destination states movers went to experienced higher post-war economic growth than the ones they left behind.

Human Capital and Peer Exposure Effects

In Section 2 I described how internment camp communities were an heterogeneous mix of people, with diverse economic and human capital backgrounds who interacted in close proximity through social activities and internee-operated adult education programs. This could, in turn, have enabled information and skills exchange during internment. As such, I consider the camps' economic and human capital diversity as a potential channel behind the earnings and mobility effects.[54]

[53]This suggests that within the broader channel of occupational change, transitions out of low-paying agriculture jobs might have played an important role. This would be consistent with what has been found in other contexts of forced displacement (Bauer et al., 2013; Sarvimäki et al., 2019).

[54]This channel would encompass learning about new information, skills, and opportunities both through social interactions and through the more formal adult education programs in place in the camps (Su, 2011). Since the latter were operated and taught by internees, they could not have taken place in the absence of human capital diversity in the camps.

While I am not able to test for a direct link between information and skills exchange and later incomes, I provide suggestive evidence consistent with this channel. First, I quantitatively document the ten camps' high economic and human capital diversity. I then show that most internees were exposed to more high-skill persons in the camps than in their previous communities. Finally, I provide evidence indicating a decrease in group income inequality, and a decrease in the intergenerational correlation of income driven by sons of poorer families. These two results are consistent with the initially less skilled seeing their labor-market outcomes improve the most, something we would expect from information and skills exchange enabled by exposure to higher economic diversity.

Using WRA internment records, Figure 2 plots the distribution of occupational skills, the distribution of educational attainment of adult internees, and the distribution of previous place of residence size. The figure shows how Japanese Americans had diverse backgrounds and skills, and how this diversity was present in each of the ten internment camps.

Table 2 additionally shows that most internees were surrounded in the camps by higher numbers of highly educated and highly skilled individuals, than in their pre-internment communities (see Table 2 description in Section 2). Moreover, even for those who might have lived close to high-skill people in their previous communities, camp life was such that close social interaction between people of different economic backgrounds was more likely than in previous communities of the same size. Not only through camp organization and social activities, but also through the adult education programs described in Section 2.[55]

If there were any benefits to internment due to the exchange of skills and information, they may have been disproportionately experienced by internees who were initially less skilled. A fact that would be consistent with this is if, as a group, internees became more equal in terms of income as a consequence of internment. Figure 7 shows that the Census data used for the difference-in-differences analysis is consistent with this idea. I plot the trend in the coefficient of variation of income as a measure of inequality for likely internees, together with that of non-interned Japanese and West Coast Chinese as comparison. While inequality increased for internees before and after internment (from a coefficient of variation of 0.61 to 0.63), that of the control group increased substantially more (from 0.65 to 0.78). Under a parallel trends assumption, this would suggest that internment turned internees into a more homogeneous group.

Finally, I study the possibility of a change in the relationship between parents' and sons incomes. I use JARP data, where I observe family linkages, internment, and measures of family income in the 1960s. I test whether the correlation between Nisei incomes and that of their parents is different across previously interned and not interned respondents.[56] For

[55]The combination of common ethnic and cultural background, but diverse human capital could have facilitated learning new skills and changing aspirations ("role model" channel). Indeed, the idea that cultural and racial similarity might facilitate the exchange of skills and information is not new. The economics of education literature has consistently found increases in achievement when students are matched to instructors who are demographically similar (in terms of race, ethnicity, or sex).Dee (2005) finds this type of result for K-12 education, Fairlie et al. (2014) for community college, and Hoffmann and Oreopoulos (2009) for college. Price (2010) finds that black college students persist more in STEM majors if matched to black STEM course instructors.

[56]In practice I observe for both Issei and Nisei a reported bracket of family income (survey allowed respondents to choose between eight different brackets). In both cases it refers to contemporaneous income at the time

each Issei respondent I compute a residual income measure that nets out age, sex of respondent, and past internment. This Issei income score is meant to capture earnings potential abstracting from age and internment effects.

Figure 8 shows binned scatterplots of the relationship between Nisei incomes and the income score of their parents, separately by past internment status. The left panel (linear fit line) shows that the relationship between sons' incomes and their parents' income scores is weaker for Japanese Americans who were interned. The right panel (quadratic fit line) suggests that the weaker relationship is coming mostly from sons of poorer families. Table 6 estimates these relationships in an OLS regression adding additional controls. The same pattern from Figure 8 emerges although the differences are somewhat noisily estimated. Adding demographic and education controls improves precision, making the differences significant at the 10% level.

Other Mechanisms

Increased labor supply or work effort

Given the asset and income losses that internees experienced during internment, it is plausible that they increased their work effort and labor supply in order to make up for these losses.[57] While such a response would be consistent with the positive effect on incomes, one could think that this mechanism was more likely in the immediate aftermath of internment, but less so 5 and 15 years afterward.

I check whether the data supports this hypothesis in two different ways using JARP and the Census. JARP Issei respondents were asked whether they had ever taken a vacation for more than a weekend. The second row of Figure 9 compares the responses of former internees and non-internees. Both groups present rather similar probabilities of ever having taken a vacation. If anything, former internees were slightly more likely to have done so.

Next, I use Census data on hours and weeks worked and apply the DiD strategy from equation (5) to test for the presence any positive effects on labor supply. Appendix Table A5 shows the results of such exercise by specification, control group, and dependent variable. Columns 1-3 show the DiD coefficient β estimate and standard error for Census question of hours worked last week. Columns 4-6 do the same when using as dependent variable weeks worked last year.[58] Results on hours worked are positive but small (on the order of 0.3 - 2 hours per week) and the majority are not statistically different from zero. Results on weeks worked are however mostly negative and not very stable when varying the control group. Negative coefficients have magnitudes between -1.5 and -2. When only using non-

of the survey. For each person, I take the midpoint of their reported bracket as their income level.

[57] My data sources do not allow me to quantify well the amount of asset losses. However, I can study home ownership as a related statistic. Appendix Figure A8 shows the evolution of home ownership for Issei JARP respondents, separately by whether they were interned or not. Both groups show the same evolution before internment, interned are 10pp (relative to a baseline of 40%) less likely to own their house between 1946-1952. By 1953-mid1960s, however, they have caught up in this margin and once again show a similar home ownership rate.

[58] Both hours worked last week and weeks worked last year are reported in intervals in Census data for this period. I assign each respondent the midpoint of their interval in order to estimate these regressions.

interned Japanese as control, coefficients are positive but not significantly different from zero.

Note that these DiD results should be interpreted with caution, since labor supply is noisily reported in the Census, and it is hard to asses the parallel trends assumption for these dependent variables. However, these results together with JARP survey responses do not suggest that increased labor supply or work effort might have played a big role in explaining the long-term positive income effect of internment.

Attitudes toward work

Could it be that the unconventional labor market institutions in place during internment led internees to change their attitudes towards work in different ways than that reflected in labor supply? I use JARP Nisei responses to several questions to address this possibility. Rows 3-6 of Figure 9 show that former internees and non internees were equally likely to agree with the statement that effort pays off, with the importance of living for the present, the assertion that Americans place too much stress on occupational success, and that how money is made is more important than how much is made. This evidence suggests that internment did not affect long-run attitudes toward merit, work, or occupational status.

Assimilation and cultural preferences

Finally, one might think that mass internment could alter in some way the preferences of individuals over cultural and identity aspects, which somehow translate into employment and migration decisions. To test this hypothesis I compare assimilation measures of internees and non-internees in the JARP survey.

The first row of Figure 9 shows that former internees and non-internees were equally likely to work for/with other Japanese Americans. The top-left panel of Figure 10 displays the answers of a JARP question which asked Issei respondents to state how American versus how Japanese they felt. The distribution of answers of Issei internees practically coincides with that of non-interned respondents. The top-right panel of Figure 10 shows the probability that an Issei respondent had obtained American citizenship by the time of the survey.[59] Non-interned Issei were more likely to have become naturalized (68% vs. 55%). However, assuming that citizenship is associated with better labor market prospects, the sign of this difference is not consistent with explaining the positive income effect of internment. Finally, the bottom-left panel of Figure 10 makes use of JARP third generation respondents (the Sansei). It plots the proportion of them who speak Japanese, separately by whether their grandparent was interned or not. The fraction of Sansei who speak Japanese, around 11%, is exactly the same for the two subgroups.

Overall I find that by the 1960s, at least in the studied margins, interned and non-interned Japanese Americans were practically identical in terms of culture and assimilation. This suggests that these type of channels are not likely to explain the long-run income effect.

[59] First generation Japanese Americans became eligible for naturalization with the Immigration Act of 1952.

7 Model of Occupational Choice: Evolution of Occupational Barriers

So far the evidence suggests that the need to re-optimize from scratch after internment led former internees to access different locations and occupations than the ones they would have in the absence of internment. I have also provided suggestive evidence on how this could have been facilitated by the exchange of skills and information, enabled by a prolonged interaction of diverse peers in the camps. That is, an interpretation of the evidence is that internment reduced frictions preventing individuals to access their most productive occupations and locations.

To test this hypothesis I borrow and adapt a logistic model of occupational choice from Hsieh et al. (2013) which features group-occupation specific frictions. Through the lens of this model, I am able to interpret observable statistics of the occupation and income distributions as the barriers that each group (internees vs. non-internees) faced when accessing different occupations. I compute these model-implied frictions in Census data before and after the internment episode, and study the evolution of barriers faced by internees relative to non-internees in accessing different occupations. The following model description is based on Hsieh et al. (2013).

Setup

There is a population of individuals and each belongs to one of two different groups g: interned Japanese Americans, or non-interned Japanese Americans and Chinese. There are N possible occupations, one of which is the home sector. Individuals differ in their occupation-specific abilities. Each individual randomly draws a vector of occupational abilities $(\epsilon_1, \epsilon_2, ..., \epsilon_N)$ from the following extreme value distribution:

$$F(\epsilon_1, \epsilon_2, ..., \epsilon_N) = \exp\Big\{ - \big[\sum_{j=1}^{N} T_j \epsilon_i^{-\theta}\big]^{1-\rho}\Big\} \tag{6}$$

The parameter ρ is related to the correlation of skills for an individual, while θ is related to the same correlation and the overall dispersion of skills.[60]

Each individual derives utility from consumption c and leisure $(1-s)$ according to the utility function

$$u(c, s) = c^{\beta}(1-s) \tag{7}$$

where c is consumption, s is time spent on human capital accumulation, and β governs the tradeoff between the two.

Each individual works one unit of time in his occupation of choice j. In a pre-period, the

[60] Following Hsieh et al. (2013), the expression in equation 6 is actually a re-parametrization of the actual distribution which makes notation more manageable. The actual distribution is $F(\epsilon_1, \epsilon_2, ..., \epsilon_N) = \exp\Big\{ - \big[\sum_{j=1}^{N} (\tilde{T}_j \epsilon_i^{-\tilde{\theta}})^{\frac{1}{1-\rho}}\big]^{1-\rho}\Big\}$, and $\theta \equiv \tilde{\theta}/(1-\rho)$ and $T_g \equiv \tilde{T}_g^{\frac{1}{1-\rho}}$.

individual makes the choice of how much time to devote to human capital accumulation h. This is done by combining time s and educational inputs e according to the following function:

$$h(e,s) = s^{\phi_j} e^{\eta} \tag{8}$$

where the elasticity of human capital with respect to time invested, ϕ_j, varies across occupations and η represents the elasticity with respect to educational inputs.

Individuals' decisions are distorted by frictions that vary across occupations j and groups g. They come in two different forms: τ^w_{jg} is a labor market friction that acts as a tax on earnings for individuals of group g employed in occupation j. It can be interpreted as an occupation-group specific form of wage discrimination.

On the other hand, τ^h_{jg} represents a human capital friction. It acts as a barrier that makes it harder for individuals in group g to acquire human capital to work in occupation j. It comes in the form of a mark-up on educational expenditures and it can broadly be interpreted as barriers that prevent individuals from acquiring the skills or information that are relevant to access a given occupation.

An individual belonging to group g employed in occupation j faces the following budget constraint:

$$c = (1 - \tau^w_{jg}) w_j \epsilon_j h(e,s) - (1 + \tau^h_{jg}) e \tag{9}$$

Where earnings are determined by the per-efficiency unit of labor wage in occupation j, w_j, the individual's ability in that occupation, ϵ_j, as well as the acquired human capital and the wage friction. Expenditures on educational inputs e are inflated by the human capital mark-up.

Optimal choice

Conditional on a given occupation j, each individual solves the following problem:

$$\begin{aligned} U_j = \max_{c,s,e} \quad & c^{\beta}(1-s) \\ \text{s.t.} \quad & c = (1 - \tau^w_{jg}) w_j \epsilon_j h(e,s) - e(1 + \tau^h_{jg}) \end{aligned} \tag{10}$$

The solution to this problem provides the optimal levels of s and e for a given occupation j. Substituting the optimal values, we arrive to the indirect utility of occupation j:[61]

$$U_j = \left(\frac{w_j s_j^{\phi_j} (1 - s_j)^{\frac{1-\eta}{\beta}} \epsilon_j \eta^{\eta} (1-\eta)^{1-\eta}}{\tau_{jg}} \right)^{\frac{\beta}{1-\eta}} \tag{11}$$

Where the term τ_{jg} combines the two types of frictions in the following way:

$$\tau_{jg} \equiv \frac{(1 + \tau^h_{jg})^{\eta}}{1 - \tau^w_{jg}} \tag{12}$$

[61] The optimal levels of s and e are $s^*_j = \frac{1}{1 + \frac{1-\eta}{\beta \phi_j}}$ and $e^*_{jg} = \left(\frac{\eta (1 - \tau^w_{jg}) w_j s_j^{\phi_j} \epsilon_j}{1 + \tau^h_{jg}} \right)^{\frac{1}{1-\eta}}$

Individuals choose the occupation j that delivers the highest utility U_j. Hsieh et al. (2013) show how a closed form for the occupational shares across groups can be obtained from optimal choices across individuals thanks to the characteristics of the extreme value distribution (McFadden, 1974). The usefulness of the model stems from the fact that it allows to compute measures of τ_{jg}, a composite of labor market and human capital frictions, as a function of observable statistics in the data.

Computing occupational barriers τ_{jg}

Under the distributional assumptions of the model, the equilibrium share of group g (internees or non-internees in this case) employed in occupation j, p_{jg}, has the following log-linear form:

$$\ln p_{jg} = \underbrace{\kappa_g}_{\substack{\text{group}\\\text{effect}}} + \underbrace{\alpha_j}_{\substack{\text{occ.}\\\text{effect}}} + \theta \cdot \underbrace{\ln w_j}_{\substack{\text{per eff.}\\\text{unit wage}}} - \theta \cdot \underbrace{\ln \tau_{jg}}_{\text{friction}} \tag{13}$$

The group effect, κ_g, is a combination of the frictions that group g faces in accessing *all* occupations. The occupation effect, α_j, is related to the differing human capital accumulation technologies in different occupations.[62] The term w_j is the wage per efficiency unit in occupation j, and τ_{jg} is the composite friction that group g faces in occupation j. These last two terms are scaled by θ, one of the parameters of the talent distribution.

The model also implies that in equilibrium, average earnings are log linearly separable into an occupation term and a group term:[63]

$$\ln \overline{wage}_{jg} = \underbrace{\gamma_j}_{\substack{\text{occ.}\\\text{effect}}} - \frac{1}{\theta(1-\eta)} \underbrace{\kappa_g}_{\substack{\text{group}\\\text{effect}}} \tag{14}$$

The key result of the model, made clear in equation (14), is that average wages for a given group in a given occupation do *not* depend on the level of frictions they face in that occupation. This is due to a positive selection effect arising by within-group heterogeneity in ability for occupation j. When frictions in occupation j are high for group g, only its most talented individuals (high ϵ_j) find optimal to access the occupation. Given the model assumptions, this positive selection effect perfectly offsets the friction effect that pushes earnings downwards.[64]

Equations (13) and (14) provide the key to recovering τ_{jg} from the data. Specifically, we can express relative frictions of group i (interned) with respect to those of group c (not interned) for each occupation g in terms of occupation odds ratios and wage gaps, which

[62] In terms of the parameters of the model $\alpha_j \equiv \ln T_j + \theta\phi_j \ln s_j + \theta(\frac{1-\eta}{\beta}) \ln(1-s_j)$; $\kappa_g \equiv \ln\big[\sum_{s=1}^{N} \tilde{w}_{sg}^{\theta}\big]$, where $\tilde{w}_{jg} = \frac{T_j^{\frac{1}{\theta}} w_j s_j^{\phi_j} (1-s_j)^{\frac{1-\eta}{\beta}}}{\tau_{jg}}$.

[63] Note that in terms of the model $\overline{wage}_{jg} \equiv (1-\tau_{jg}^{w}) w_j \mathbf{E}(h_j \epsilon_j)$. Hsieh et al. (2013) provide an expression for $\mathbf{E}(h_j \epsilon_j)$ which results in the above.

[64] A result that follows and that is taken into account in the empirical implementation is that average wage gaps between two groups are constant across occupations.

are observable in the data:

$$\ln\left(\tau_{ji}/\tau_{jc}\right) = -\frac{1}{\theta}\ln\left(p_{ji}/p_{jc}\right) - (1-\eta)\ln\left(\overline{wage}_i/\overline{wage}_c\right) \tag{15}$$

That is, the relative composite friction for occupation j for group i is expressed in terms of the occupational odds ratios, normalized by the wage gap and scaled by the parameters θ and η.

The expression in equation (15) corresponds to the composite friction, containing both labor market discrimination and human capital barriers. If we assume that both groups faced the same labor market discrimination due to their Asian origin then:

$$\begin{aligned} \tau^w_{ji} &= \tau^w_{jc} \;\; \forall j, \quad \text{and} \\ \ln\left(\tau_{ji}/\tau_{jc}\right) &= \ln\left(\left(1+\tau^h_{ji}\right)/\left(1+\tau^h_{jc}\right)\right)\eta \end{aligned} \tag{16}$$

This assumption allows the recovery of the human capital frictions that internees faced with respect to their DiD control group. These types of frictions—barriers that prevent individuals from acquiring skills or information—are precisely the ones more likely to have been affected by the internment episode.[65] Note that even if the assumption in equation (16) does not hold, the right-hand-side of equation (15) can still be interpretable as a *composite* of labor market and human capital barriers.

Empirical results

I compute measures of the relative frictions faced by internees, $\ln\left(\tau_{ji}/\tau_{jc}\right)$, using the expression in equation (15). I do this separately in 1940 and 1960 Census data and analyze their evolution before and after internment.

I use the same DiD sample from Section 5.[66] I compute average wage gaps $\overline{wage}_i/\overline{wage}_c$ using total annual income, the same measure as in the DiD analysis. I assign individuals to 7 occupational categories, consistent with those in JARP survey, where one of them is the home sector.[67]

Figure 11 shows the evolution of $\widehat{\ln\left(\tau_{ji}/\tau_{jc}\right)}$, the barriers faced by internees, relative to the control group, in accessing three relevant occupational categories: professional, white collar, and blue collar occupations.[68] A value of zero for a given occupation indicates that

[65] Hsieh et al. (2013) measure all frictions relative to those of whites males, who they assume face no frictions and thus $\tau_{jWM} = 1 \;\forall j$.

[66] Males born between 1896 and 1924 who are Japanese and living in the continental U.S., or Chinese living in the West Coast states. I follow the same approach as in previous parts of the paper and assign to the internee category i Japanese individuals with estimated probability of internment higher than .75. Individuals in the control category c are West Coast Chinese plus Japanese with estimated probability of internment lower than .25.

[67] In dealing with the home sector I follow Hsieh et al. (2013). I assign to the home sector those who are currently not employed or those that worked less than 26 weeks in the year. I split the sampling weight of those who worked part of the year (worked between 26 and 39 weeks) between the home sector and the occupation in which they work. I impute the average earnings in the home sector from the group composition in terms of schooling, age, place of birth, state of residence, and race and using the relationship between these variables and income in the market sector.

[68] I take Hsieh et al. (2013) parameter values of $\theta(1-\eta) = 1.36$ and $\eta = .103$. They estimate these param-

internees, as a group, faced the same level of labor market and human capital frictions as non-interned Japanese Americans and West Coast Chinese.

Figure 11 shows that, between 1940 and 1960, the barriers faced by internees when accessing these occupations fell significantly with respect to the control group. Before internment, internees-to-be faced significantly higher barriers to accessing professional and blue collar jobs, and a similar level in accessing white collar jobs. However, according to these results, by 1960 the picture had flipped and former internees now faced *less* labor market and human capital barriers in all of these three broad occupational categories.

I interpret these results as supportive of the human capital and re-optimization mechanisms from Section 6. The evidence is consistent with some internees who, in the absence of internment, would have never accessed a given set of occupations or locations doing so because internment i) made them re-evaluate and start from scratch, and ii) exposed them to new information or skills in the camps.

8 Conclusion

This paper has studied the career consequences of the forced removal and internment of thousands of West Coast Japanese Americans during WWII. In order to do so I have combined different publicly available data sources from before, during, and after the episode: Census data, administrative camp records, and a 1960s sociological survey of Japanese Americans. By combining these datasets I have been able to develop a method that computes a nonparametric estimate of a person's probability of internment based on Census observables. Thanks to this method, I have estimated the long-run effect of internment on earnings using Census repeated cross-sections and a difference-in-differences (DiD) approach, using the fact that West Coast Chinese Americans and Japanese Americans living outside the West Coast were not affected by this episode. The results from this exercise imply that 5 and 15 years later, internment caused former internees to generate annual incomes that were on average between 9% and 22% higher than the counterfactual.

The positive effect of internment on long-run earnings can be surprising when taking into account the forced nature of the removal, the significant asset and income losses that internees experienced, and the lost labor market attachment during internment. However, my investigation of the mechanisms points to a re-optimization of job and location choices after internment (up the job ladder, and to higher-growth states) as an explanation of the positive effects. The forced and massive nature of the displacement meant that after leaving camps, many internees had to start from scratch in a way in which frictions that typically prevent mobility—adjustment and migration costs, community ties—were significantly less prevalent. I have also provided suggestive evidence consistent with the idea that the unique and new communities that arose in the camps could have facilitated mobility through the exchange of information and skills.

eters using 1) the fact that wages within an occupation for a given group should follow a Frechet distribution governed by $\theta(1-\eta)$, and 2) calibrating η, the elasticity of human capital with respect to expenditures, using educational expenditure shares in U.S. GDP.

Japanese American internment constituted a grave violation of civil rights and personal freedoms whose costs are vast and hard to quantify. In all my empirical analysis I do not speak to these costs. However, the findings of this paper do provide some hopeful evidence on the ability of individuals to take the opportunities that a negative shock presents and overcome adversity in the long-run. Further, it provides insight into the importance of barriers to occupation and geographic mobility, and some notions on mechanisms that might lower these barriers.

References

Abramitzky, R., L. P. Boustan, and K. Eriksson (2014). A nation of immigrants: Assimilation and economic outcomes in the age of mass migration. *Journal of Political Economy 122*(3), 467–506.

Angrist, J. D. and A. B. Krueger (1992). The effect of age at school entry on educational attainment: an application of instrumental variables with moments from two samples. *Journal of the American statistical Association 87*(418), 328–336.

Bauer, T. K., S. Braun, and M. Kvasnicka (2013). The economic integration of forced migrants: Evidence for post-war Germany. *The Economic Journal 123*(571).

Bess, D. (1955). California's amazing Japanese. *The Saturday Evening Post 227*(44).

Chetty, R. and N. Hendren (2018). The impacts of neighborhoods on intergenerational mobility II: County-level estimates. *The Quarterly Journal of Economics*.

Chetty, R., N. Hendren, and L. F. Katz (2016). The effects of exposure to better neighborhoods on children: New evidence from the moving to opportunity experiment. *The American Economic Review 106*(4), 855–902.

Chin, A. (2005). Long-run labor market effects of Japanese American internment during World War II on working-age male internees. *Journal of Labor Economics 23*(3), 491–525.

Chyn, E. (2018). Moved to opportunity: The long-run effects of public housing demolition on children. *The American Economic Review 108*(10), 3028–56.

Daniels, R. (2000). Why were Japanese Americans interned during World War II? In A. Y. Murray (Ed.), *What did the internment of Japanese Americans mean?* Boston, Massachusetts: Bedford/St Martin's.

Daniels, R. (2004). *Prisoners without trial: Japanese Americans in World War II*. New York: Hill and Wang.

Dee, T. S. (2005). A teacher like me: Does race, ethnicity, or gender matter? *The American Economic Review 95*(2), 158–165.

Deryugina, T., L. Kawano, and S. Levitt (2018). The economic impact of Hurricane Katrina on its victims: Evidence from individual tax returns. *American Economic Journal: Applied Economics 10*(2).

Fairlie, R. W., F. Hoffmann, and P. Oreopoulos (2014). A community college instructor like me: Race and ethnicity interactions in the classroom. *The American Economic Review 104*(8), 2567–2591.

Guiso, L., L. Pistaferri, and F. Schivardi (2015). Learning entrepreneurship from other entrepreneurs? Working Paper 21775, National Bureau of Economic Research.

Higgs, R. (1978). Landless by law: Japanese immigrants in California agriculture to 1941. *The Journal of Economic History 38*(1), 205–225.

Hilger, N. (2016). Upward mobility and discrimination: The case of Asian Americans. Working Paper 22748, National Bureau of Economic Research.

Hoffmann, F. and P. Oreopoulos (2009). A professor like me: The influence of instructor gender on college achievement. *Journal of Human Resources 44*(2), 479–494.

Horowitz, J. L. and C. F. Manski (2000). Nonparametric analysis of randomized experiments with missing covariate and outcome data. *Journal of the American Statistical Association 95*(449), 77–84.

Hsieh, C.-T., E. Hurst, C. I. Jones, and P. J. Klenow (2013). The allocation of talent and U.S. economic growth. Working Paper 18693, National Bureau of Economic Research.

Hsieh, C.-T. and P. J. Klenow (2009). Misallocation and manufacturing TFP in China and India. *The Quarterly Journal of Economics 124*(4), 1403–1448.

Imbens, G. W. and J. D. Angrist (1994). Identification and estimation of local average treatment effects. *Econometrica 62*(2), 467–475.

Japanese American National Museum (2017). Instructions to all persons: Reflections on Executive Order 9066. February-August 2017.

Katz, L. F., J. R. Kling, and J. B. Liebman (2001). Moving to Opportunity in Boston: Early results of a randomized mobility experiment. *The Quarterly Journal of Economics 116*(2), 607–654.

Lee, D. S. (2009). Training, wages, and sample selection: Estimating sharp bounds on treatment effects. *The Review of Economic Studies 76*(3), 1071–1102.

Leighton, A. H. (1950). *The Governing of Men: General Principles and Reccommendations Based on Experience at a Japanese Relocation Camp*. Princeton University Press.

Levine, G. N. (2006). Japanese-American Research Project (JARP): a three-generation study, 1890-1966.

Levine, G. N. and C. Rhodes (1981). *The Japanese American community: A three-generation study*. Praeger Publishers.

McFadden, D. (1974). Conditional Logit Analysis of Qualitative Choice Behavior. In P. Zarembka (Ed.), *Frontiers in Econometrics*, pp. 105–142. New York: Academic Press.

Nakamura, E., J. Sigurdsson, and J. Steinsson (2019). The gift of moving: Intergenerational consequences of a mobility shock. Mimeo, UC Berkeley and Stockholm University.

Niiya, B. (2017). Japanese American Research Project — Densho Encyclopedia . [Online; accessed 16-July-2017].

Okubo, I., T. Ogita, V. Takemura, K. Naruse, M. Rikimaru, Y. Takayama, I. Miyamoto, J. Makimoto, M. Suzuki, M. Oye, and J. A. Rademaker (1943). Granada community analysis report. Technical Report 2, Community Analysis Section, Granada Relocation Center.

Price, J. (2010). The effect of instructor race and gender on student persistence in STEM fields. *Economics of Education Review 29*(6), 901–910.

Ruggles, S., K. Genadek, R. Goeken, J. Grover, and M. Sobek (2015). Integrated public use microdata series: Version 6.0 [dataset].

Saavedra, M. (2013). Early childhood conditions and mortality: Evidence from Japanese American internment. Mimeo, Oberlin College.

Saavedra, M. (2015). School quality and educational attainment: Japanese American internment as a natural experiment. *Explorations in Economic History 57*, 59–78.

Sacerdote, B. (2012). When the saints go marching out: Long-term outcomes for student evacuees from Hurricanes Katrina and Rita. *American Economic Journal: Applied Economics 4*(1), 109–35.

Sarvimäki, M., R. Uusitalo, and M. Jäntti (2019). Habit formation and the misallocation of labor: evidence from forced migrations. Mimeo, Aalto University and University of Helsinki.

Shoag, D. and N. Carollo (2016). The causal effect of place: Evidence from Japanese-American internment. Mimeo, Harvard University and University of California Los Angeles.

Spicer, E. H., A. T. Hansen, K. Luomala, and M. Opler (1969). *Impounded people: Japanese-Americans in the relocation centers*. University of Arizona Press.

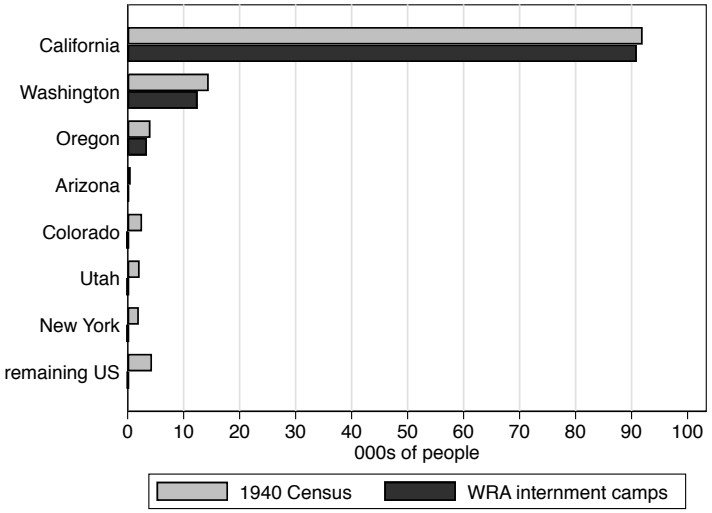
Spickard, P. R. (1996). Japanese Americans: The formation and transformation of an ethnic group. *Boston: Twayne*.

Su, C. (2011). An ambitious social experiment: Education in Japanese-American internment camps, 1942-1945. Bachelor thesis, Massachusetts Institute of Technology.

Wu, E. D. (2013). *The color of success: Asian Americans and the origins of the model minority*. Princeton University Press.

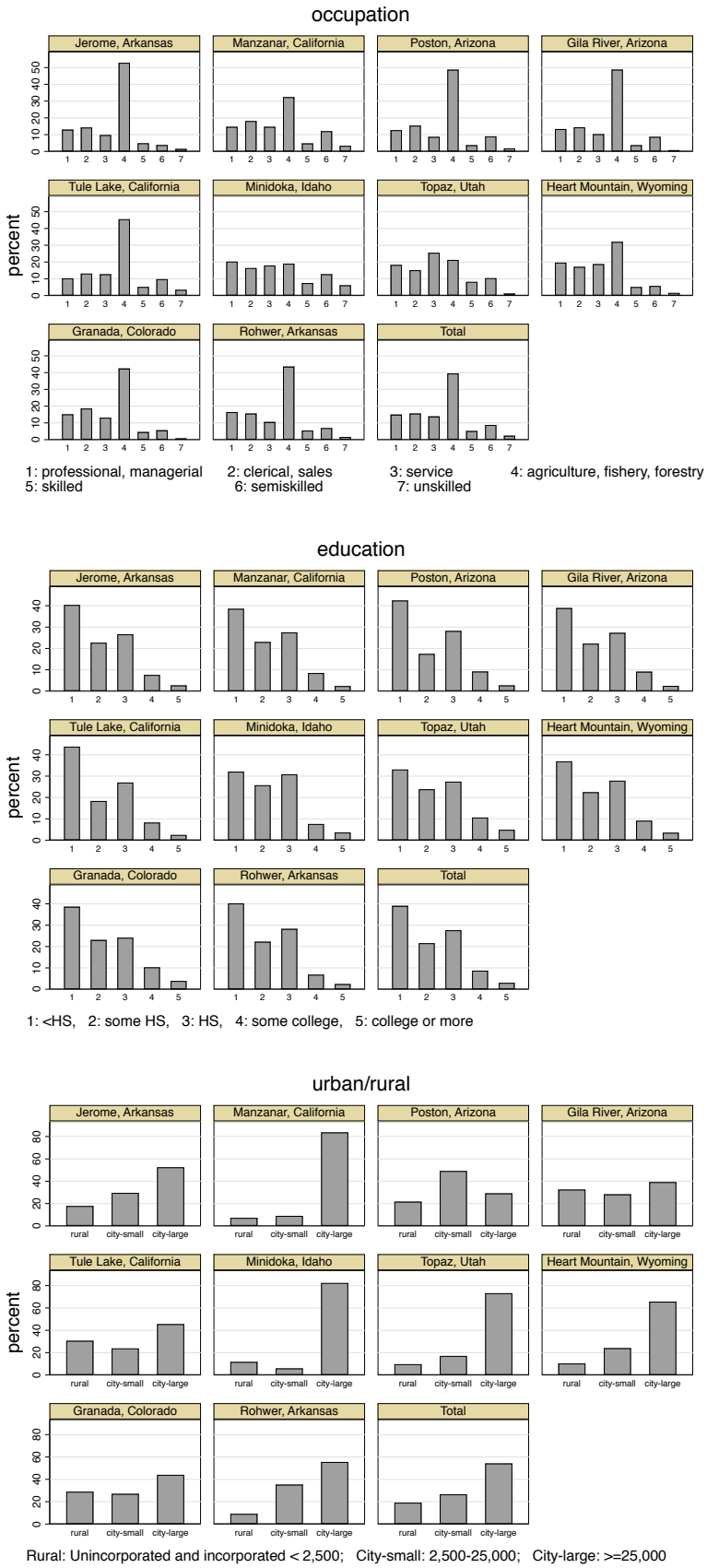
Figures

Figure 1: Japanese in 1940 Census and camp internees



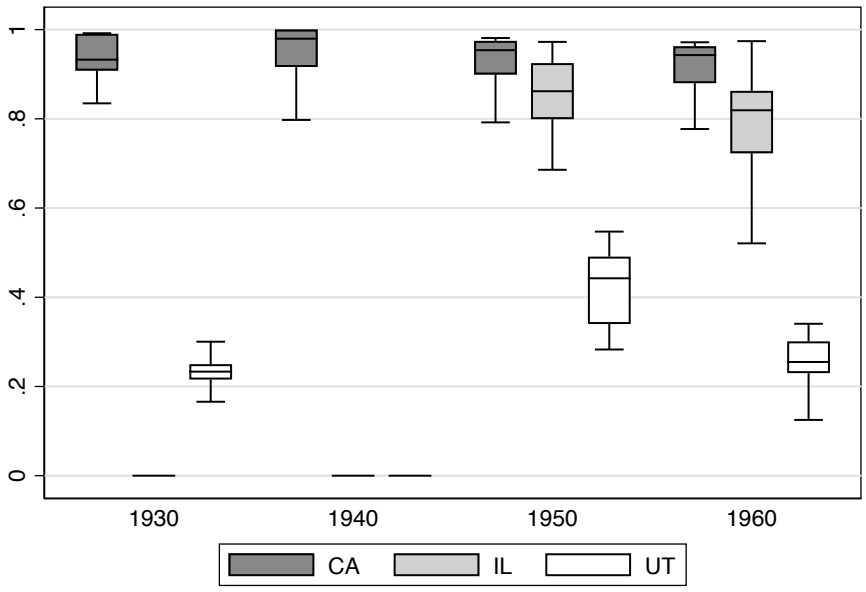
Note: Gray bars: Total number of individuals of Japanese race residing in each state in the 1940 Census. Black bars: Total number of internees in War Relocation Authority records, by previous state of residence.

Figure 2: Internment camps' economic and human capital diversity



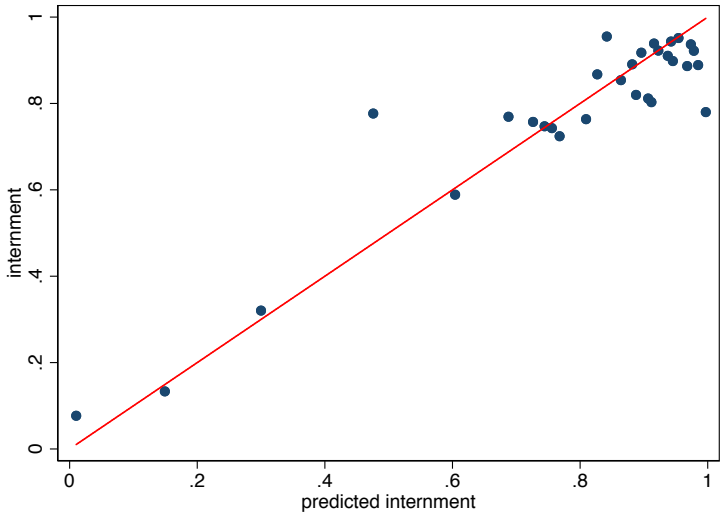
Note: Distribution of occupational skills, educational attainment, and urban/rural background in WRA records, by internment camp and overall. For educational attainment I exclude internees who were less than 18 years old.

Figure 3: Probability of internment over time for California, Illinois and Utah



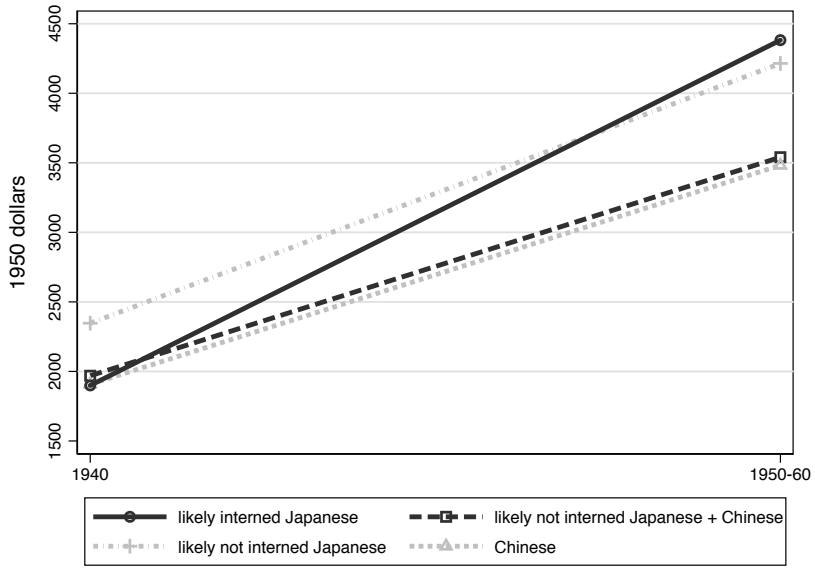
Note: Boxplots of the distribution of the estimated probability of internment for individuals of Japanese origin in different Censuses and states of residence. Probability of internment estimated as explained in the text.

Figure 4: Actual vs. predicted internment



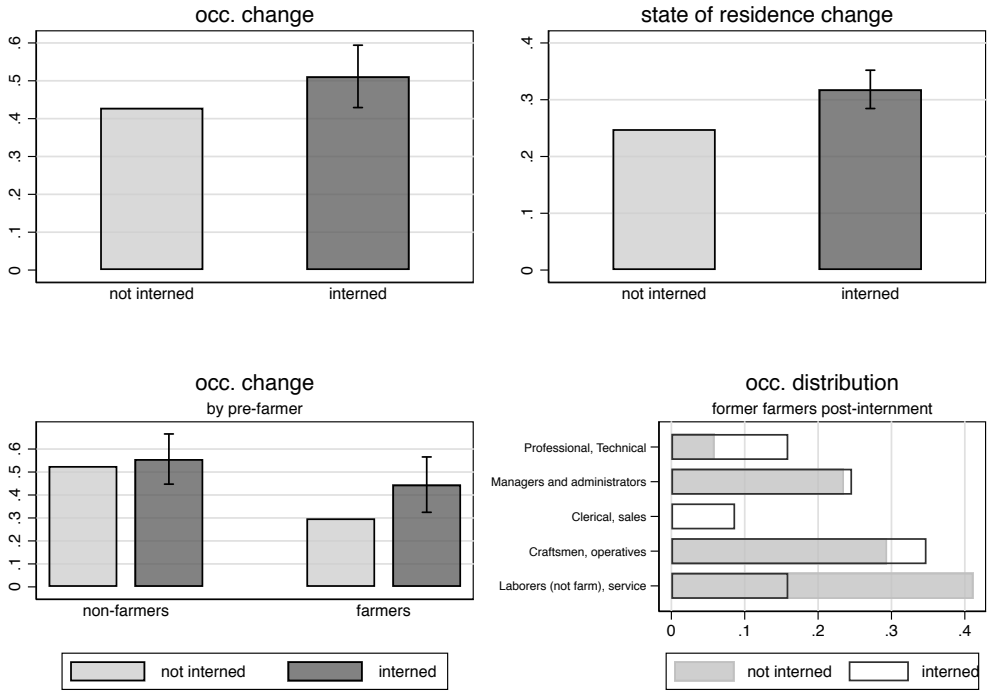
Note: 45 degree line and binned scatterplot of actual against predicted internment in Japanese American Research Project survey data. Probability of internment estimated as explained in the text.

Figure 5: Average income across time and groups



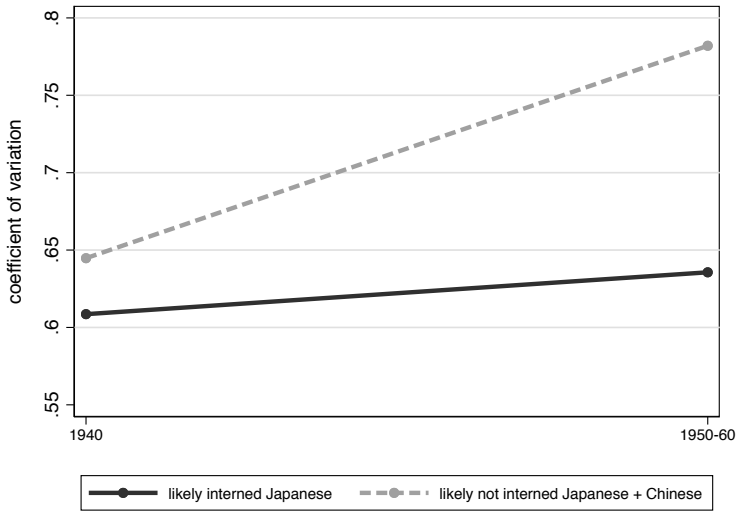
Note: Average total annual income, before and after internment by likelihood of internment. Likely interned are those Japanese with estimated probability of internment greater than .75. Not likely interned are those Japanese with estimated probability of internment less than .25. These two groups include 87 percent of the Japanese sample. Probability of internment estimated as explained in the text. Chinese residing in West Coast States (CA, WA, OR, and AZ). Census person weights are used. Males, who worked for at least 26 weeks during the year, 1896-1924 birth cohorts in 1940, 1950, and 1960 Census.

Figure 6: Occupational and geographic mobility



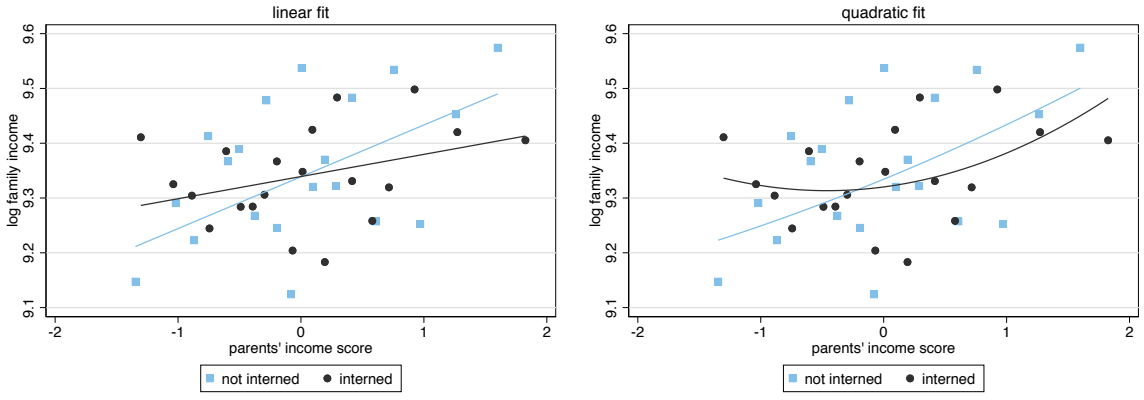
Note: Occupations: 2nd generation JARP respondents. State of residence: 1st and 2nd generation JARP respondents. Occupation change equals one if respondent stated that the main occupation held in 1932-41 was different from that in 1946-52. State of residence change equals one if respondent stated that their main residence in 1932-41 was in a different from that in 1946-52. 95% confidence intervals computed using robust standard errors from regressing an occupational/state of residence change dummy on an internment dummy.

Figure 7: Income inequality trend



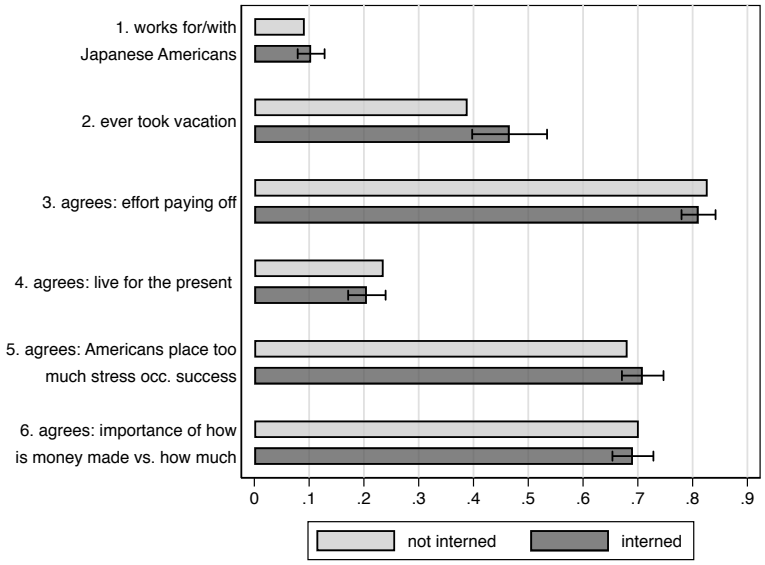
Note: Coefficient of variation of total annual income, before and after internment by likelihood of internment. Likely interned are those Japanese with estimated probability of internment greater than .75. Not likely interned are those Japanese with estimated probability of internment less than .25. These two groups include 87 percent of the Japanese sample. Probability of internment estimated as explained in the text. Chinese residing in West Coast States (CA, WA, OR, and AZ). Census person weights are used. Males, who worked for at least 26 weeks during the year, 1896-1924 birth cohorts in 1940, 1950, and 1960 Census.

Figure 8: Intergenerational income correlation



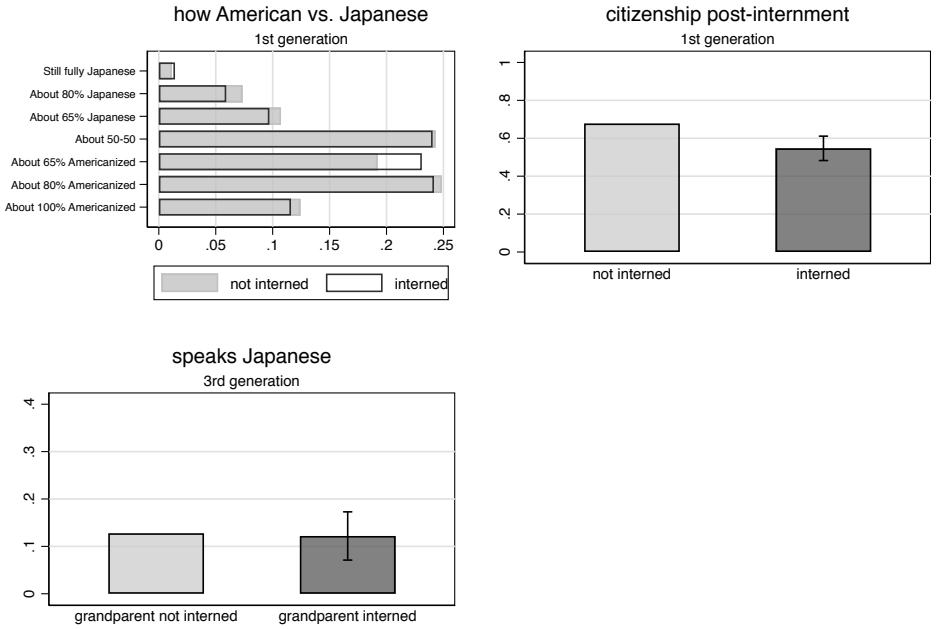
Note: Binned scatterplot. 2nd generation JARP respondents log family income as a function of their parents' residual income, by past interment status, and controlling for past internment status. N=1,584. Parents' income residualized of past internment status, a quadratic of age, year of interview dummies, and sex. Both parents' and sons' incomes are midpoints of reported income brackets. Left panel plots a linear fit, right panel plots a quadratic one.

Figure 9: Work characteristics and attitudes



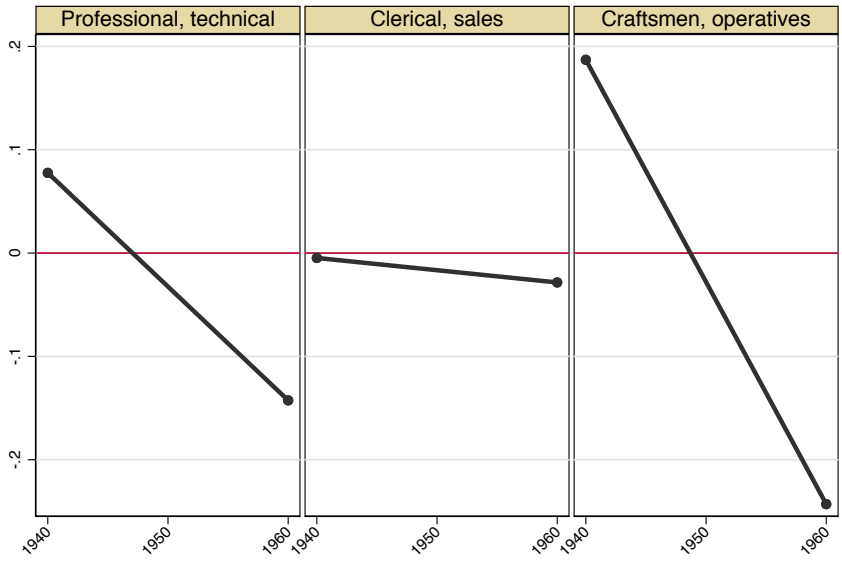
Note: Questions 1, 3, 4, 5, and 6: 2nd generation JARP respondents. Question 2: 1st generation JARP respondents. Q1 equals 1 if self-employed and reports most clients are of Japanese ancestry or if salary worker and works for Japanese or Japanese American employer. Q2: *"Did you or your wife (husband) ever take off from work for more than a week-end for a vacation with your family?"*. Q3: *"If you try hard enough you usually get what you want."*. Q4: *"Nowadays a person has to live pretty much for today and let tomorrow take care of itself."*. Q5: *"Americans put too much stress on occupational success."*. Q6: *"Even today, the way you make money is more important than how much you make."*. 95% confidence intervals computed using robust standard errors from regressing each dummy dependent variable on an internment dummy.

Figure 10: Attachment to Japan and Japanese language



Note: How American vs. Japanese survey question stated that 100% Americanized would correspond to *"[...] an Issei who has become completely American in his dress, eating habits, recreation, and all other aspects of his life."* First generation Japanese Americans became eligible for naturalization with the Immigration Act of 1952. 95% confidence intervals computed using robust standard errors from regressing each dummy dependent variable on an internment dummy.

Figure 11: Occupational frictions, internees relative to non-internees



Note: Occupation-internees specific frictions implied by Roy model, relative to non-interned Japanese and West Coast Chinese. Likely interned are those Japanese with estimated probability of internment greater than .75. Not likely interned are those Japanese with estimated probability of internment less than .25. These two groups include 87 percent of the Japanese sample. Computed in 1940 and 1960 Decennial Censuses, using Hsieh et al. (2013) parameter estimates.

Tables

Table 1: Summary statistics 1940, 1950, and 1960 Censuses

	Japanese		Chinese		All	
year of birth	1909.9	(7.955)	1907.6	(7.314)	1909.1	(7.815)
born in the U.S.	0.535	(0.499)	0.283	(0.451)	0.447	(0.497)
total annual income 1940	1928.9	(1213.0)	1908.1	(1177.7)	1921.6	(1200.8)
total annual income 1950-60	4775.1	(2936.1)	4079.0	(2831.6)	4535.8	(2918.8)
probability of internment	0.797	(0.274)	0	(0)	0.519	(0.440)
1940 Census	0.904	(0.294)	0.906	(0.291)	0.905	(0.293)
1950 and 1960 Censuses	0.0956	(0.294)	0.0935	(0.291)	0.0949	(0.293)
in California	0.782	(0.413)	0.895	(0.306)	0.822	(0.383)
in Washington	0.0924	(0.290)	0.0457	(0.209)	0.0761	(0.265)
in Oregon	0.0255	(0.158)	0.0321	(0.176)	0.0278	(0.164)
in Arizona	0.00341	(0.0583)	0.0271	(0.162)	0.0117	(0.107)
high school or more	0.522	(0.500)	0.218	(0.413)	0.416	(0.493)
college or more	0.0722	(0.259)	0.0386	(0.193)	0.0605	(0.238)
N	17,585		9,421		27,006	

Notes: Summary statistics for the pooled 1940, 1950, and 1960 DiD samples of Japanese and Chinese Americans. Average and standard deviation in parentheses. Males, 1896-1924 birth cohorts who worked at least 26 week during the past year. Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Annual total income expressed in 1950 dollars. Probability of internment computed as described in the text. 1940 100% Census, 1950 1% Census, 1960 5% Census.

Table 2: Camps' economic composition, comparison with 1940 Japanese Americans' neighborhood composition (all neighbors)

		Education: some college or more		**Occupation: professional or managerial**		**Occupation: white collar (clerical, sales)**	
(1) CAMP	(2) POP.	(3) fraction of camp (adults)	(4) quantile in 1940 neighborhood distribution	(5) fraction of camp (adults)	(6) quantile in 1940 neighborhood distribution	(7) fraction of camp (adults)	(8) quantile in 1940 neighborhood distribution
Poston, AZ	18058	0.119	0.564	0.128	0.347	0.151	0.557
Tule Lake, CA	15074	0.108	0.493	0.107	0.232	0.129	0.442
Gila River, AZ	13158	0.116	0.543	0.137	0.445	0.138	0.478
Heart Mountain, WY	10919	0.127	0.618	0.200	0.811	0.165	0.610
Manzanar, CA	10151	0.109	0.502	0.148	0.565	0.180	0.668
Minidoka, ID	9515	0.112	0.526	0.210	0.836	0.161	0.597
Topaz, UT	8566	0.155	0.779	0.185	0.741	0.149	0.538
Jerome, AR	8475	0.103	0.453	0.133	0.414	0.140	0.506
Rohwer, AR	8409	0.092	0.347	0.168	0.685	0.149	0.542
Granada, CO	6916	0.142	0.681	0.155	0.624	0.182	0.673

Source: WRA internment camp records and 1940 Census full count.

Notes: Economic composition of WRA internment camps and comparison with that experienced by Japanese Americans in 1940 West Coast (WA, OR, CA, and AZ) neighborhoods, taking into account all persons in 1940 neighborhoods. (2)-Camp population in WRA records. (3)-Fraction of highly educated adult internees (educational attainment of some college or more). (4)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of highly educated adults than that in (3). (5)-Fraction of adult internees with previous professional or managerial occupations. (6)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of professional/managerial occupation adults than that in (5). (7)-Fraction of adult internees with previous white collar occupations (clerical, sales). (8)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of white collar occupation adults than that in (7). 1940 neighborhoods are groups of Census enumeration districts within a county as described in the text (see footnote 20), with average population of 9,480 people.

Table 3: JARP baseline summary statistics - 1st generation

	Issei (first generation)					
	not interned		**interned**		**difference**	
female	0.320	(0.468)	0.336	(0.473)	-0.0160	(0.0386)
year of birth	1891.7	(8.264)	1892.8	(8.062)	-1.185	(0.740)
year arrival US	1912.6	(8.205)	1912.4	(7.022)	0.216	(0.593)
education in Japan	8.126	(3.136)	8.059	(2.940)	0.0663	(0.247)
education in US	1.088	(2.763)	0.797	(2.157)	0.291	(0.186)
Japanese neighborhood	0.129	(0.336)	0.273	(0.446)	-0.144***	(0.0360)
owns dwelling	0.196	(0.398)	0.219	(0.414)	-0.0225	(0.0349)
lives in California	0.249	(0.433)	0.784	(0.412)	-0.536***	(0.0340)
lives in Washington	0.0608	(0.240)	0.135	(0.341)	-0.0738***	(0.0267)
lives in Oregon	0.0221	(0.147)	0.0499	(0.218)	-0.0278	(0.0170)
lives in Arizona	0.0110	(0.105)	0.00232	(0.0481)	0.00873*	(0.00505)
lives elsewhere	0.657	(0.476)	0.0290	(0.168)	0.628***	(0.0204)
N	181		862		1043	

Notes: Computed using JARP survey. Difference in means significance levels: * 0.10 ** 0.05 *** 0.01. Neighborhood, dwelling ownership, and state of residence variables refer to the time period 1932-1941.

Table 4: JARP baseline summary statistics - 2nd generation

	Nisei (second generation)					
	not interned		**interned**		**difference**	
female	0.456	(0.499)	0.485	(0.500)	-0.0292	(0.0246)
year of birth	1924.2	(9.680)	1924.0	(8.300)	0.214	(0.468)
high school or more	0.862	(0.346)	0.886	(0.319)	-0.0231	(0.0366)
college or more	0.257	(0.439)	0.202	(0.402)	0.0549	(0.0462)
Japanese neighborhood	0.190	(0.393)	0.180	(0.384)	0.00964	(0.0208)
occ: professional, technical	0.0845	(0.279)	0.0549	(0.228)	0.0296	(0.0237)
occ: manager, administrator	0.0634	(0.245)	0.127	(0.334)	-0.0638**	(0.0305)
occ: clerical, sales	0.141	(0.349)	0.212	(0.409)	-0.0711*	(0.0385)
occ: craftsmen, operative	0.134	(0.342)	0.125	(0.331)	0.00911	(0.0326)
occ: laborers, service	0.148	(0.356)	0.0748	(0.263)	0.0731**	(0.0284)
occ: farmers	0.430	(0.497)	0.406	(0.492)	0.0231	(0.0482)
lives in California	0.296	(0.457)	0.767	(0.423)	-0.470***	(0.0220)
lives in Washington	0.0746	(0.263)	0.132	(0.338)	-0.0572***	(0.0165)
lives in Oregon	0.0262	(0.160)	0.0511	(0.220)	-0.0249**	(0.0106)
lives in Arizona	0.0323	(0.177)	0.00407	(0.0636)	0.0282***	(0.00513)
lives elsewhere	0.571	(0.495)	0.0465	(0.211)	0.524***	(0.0152)
N	537		1758		2295	

Notes: Computed using JARP survey. Difference in means significance levels: * 0.10 ** 0.05 *** 0.01. Neighborhood, occupation, and state of residence variables refer to the time period 1932-1941.

Table 5: Effect of internment on income - DiD estimates

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	563.92***	506.59***	476.03
	(145.41)	(147.61)	(326.47)
Education	no	no	no
Location	no	no	no
$\overline{Y}: int, post$	4367	4367	4367
% change	14.8	13.1	12.2
Observations	27006	25804	17585

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	764.63***	728.30***	540.04
	(175.46)	(179.39)	(385.14)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y}: int, post$	4156	4156	4156
% change	22.5	21.2	14.9
Observations	23965	22780	15316

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	403.74***	390.75***	353.34
	(147.40)	(148.67)	(359.40)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y}: int, post$	4367	4367	4367
% change	10.2	9.8	8.8
Observations	27006	25804	17585

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	616.97***	611.15***	489.85
	(178.42)	(179.59)	(414.21)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y}: int, post$	4156	4156	4156
% change	17.4	17.2	13.4
Observations	23965	22780	15316

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (5) in the text, varying the choice of control group and regressors. * 0.10 ** 0.05 *** 0.01. Dependent variable is annual total income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\bar{Y}: int, post$ is average total income for internees in 1950-60. % change computed as $\frac{\hat{\beta}}{(\bar{Y}: int, post) - \hat{\beta}} \cdot 100$.

Table 6: Intergenerational income correlation: OLS estimates

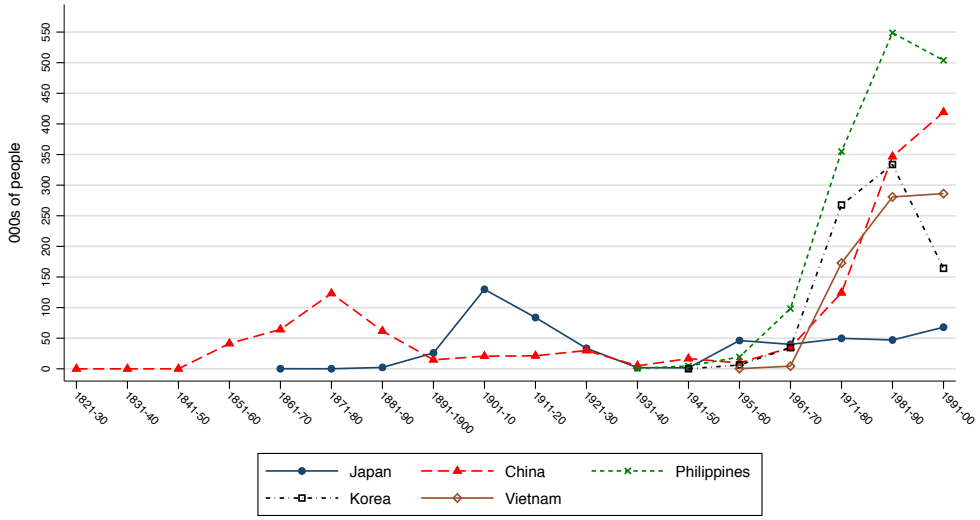
	Linear			Quadratic		
	(1)	(2)	(3)	(4)	(5)	(6)
parents' income	0.0946***	0.1266***	0.1177***	0.0920**	0.1344***	0.1259***
	(0.0343)	(0.0338)	(0.0337)	(0.0401)	(0.0390)	(0.0390)
parents' income × internment	-0.0541	-0.0687*	-0.0693*	-0.0620	-0.0808*	-0.0821*
	(0.0410)	(0.0405)	(0.0401)	(0.0475)	(0.0460)	(0.0452)
parents' income^2				0.0072	-0.0225	-0.0236
				(0.0361)	(0.0349)	(0.0346)
parents' income^2 × internment				0.0250	0.0354	0.0374
				(0.0431)	(0.0408)	(0.0392)
Internment	yes	yes	yes	yes	yes	yes
Demographics	no	yes	yes	no	yes	yes
Education	no	no	yes	no	no	yes
Clusters	651	651	651	651	651	651
Observations	1584	1582	1579	1584	1582	1579

Notes: Dependent variable is log annual family income at time of interview. JARP second generation respondents. Income computed as midpoint of reported income bracket. Parents' income also measured in JARP survey as midpoint of reported brackets. Parents' income residualized of age, internment, and year of interview effects. Internment equals one if respondent reports having been interned in a WRA camp. Demographic controls include sex of respondent and a quadratic in age. Education control is a dummy indicating high school attainment of respondent. Robust standard errors clustered at the family (parent) level. * 0.10 ** 0.05 *** 0.01.

SUPPLEMENTARY APPENDICES

A Additional Figures and Tables

Figure A1: Asian immigration to the U.S., by decade



Source: Statistical Yearbook of the Immigration and Naturalization Service, 2001.
Note: From 1820-67, figures represent alien passengers arrived at seaports; from 1868-91 and 1895-97, immigrant aliens arrived; from 1892-94 and 1898-2001, immigrant aliens admitted for permanent residence. From 1892-1903, aliens entering by cabin class were not counted as immigrants. Land arrivals were not completely enumerated until 1908.

Figure A2: Location of the 10 internment camps

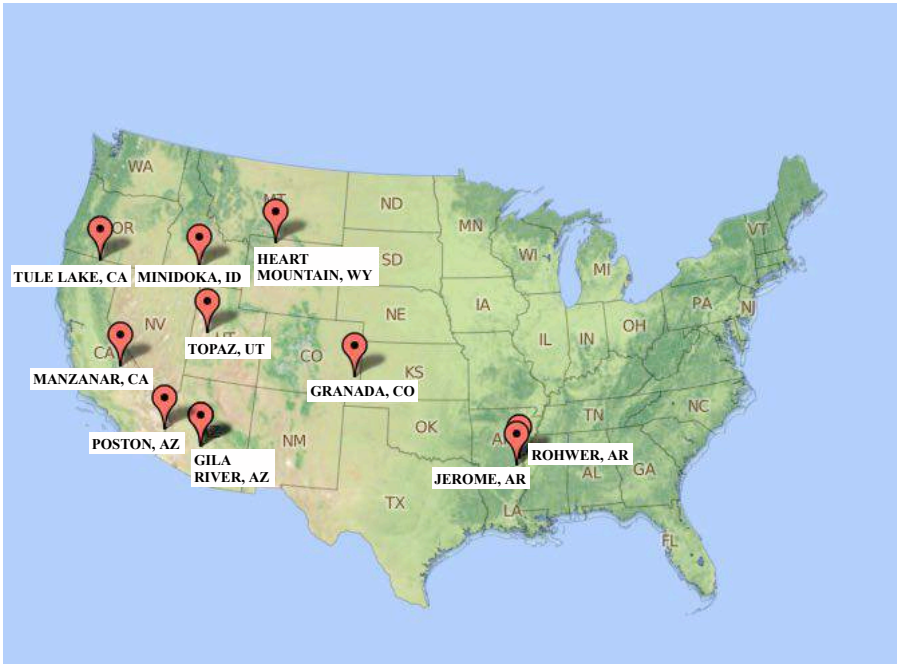
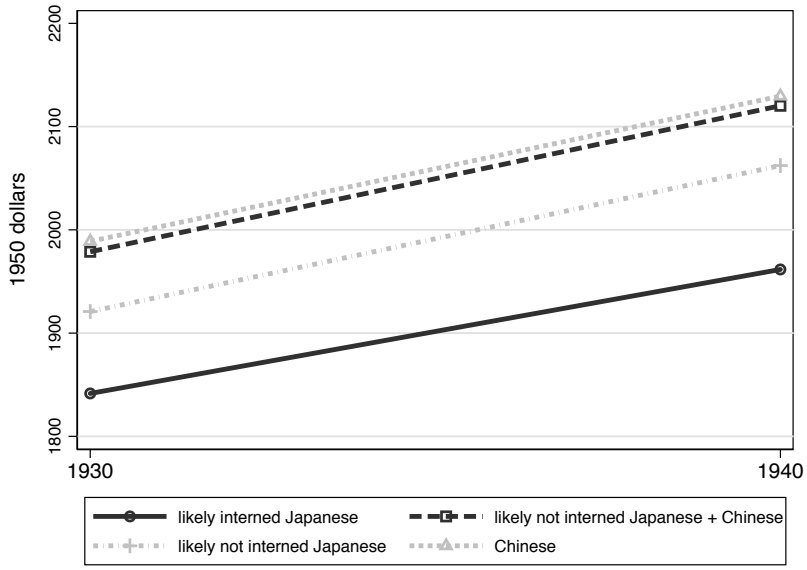


Figure A3: Diorama of Manzanar camp, CA

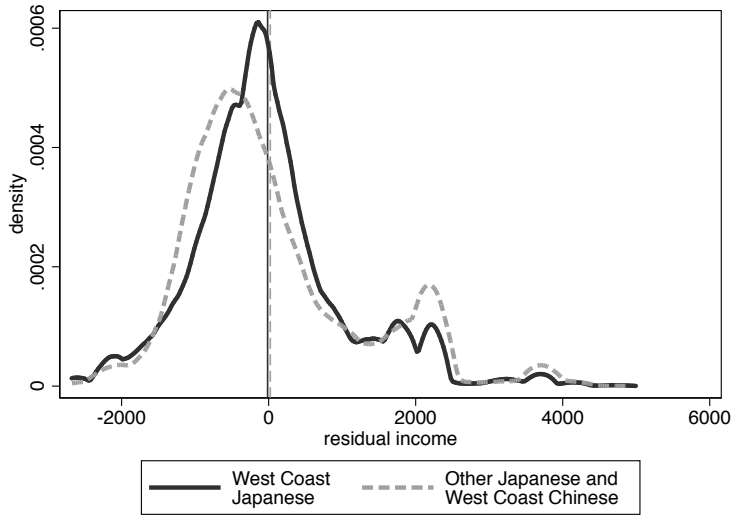
Note: Diorama created by Robert Y. Hasuike, Lance Matsushita, Dennis Masai, and Jerry Teshima. Japanese American National Museum (2017).

Figure A4: Occupational income score trends



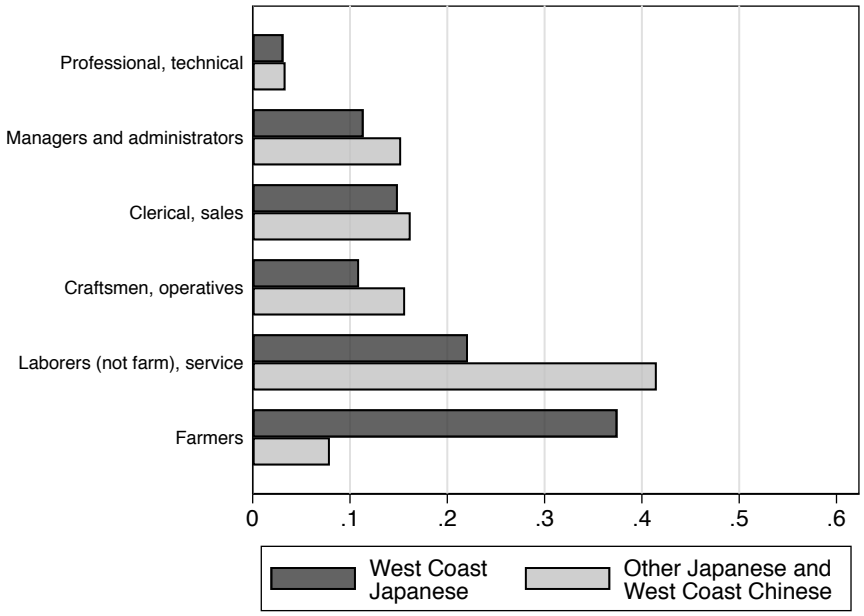
Note: Average occupational income score in 1950 dollars, by likelihood of internment. Likely interned are those Japanese with estimated probability of internment greater than .75. Not likely interned are those Japanese with estimated probability of internment less than .25. These two groups include 92 percent of the Japanese sample. Probability of internment estimated as explained in the text. Chinese residing in West Coast States (CA, WA, OR, and AZ). Census person weights are used. Males, employed, 1896-1924 birth cohorts in 1930, and 1940 Census.

Figure A5: Residual income distribution, 1940



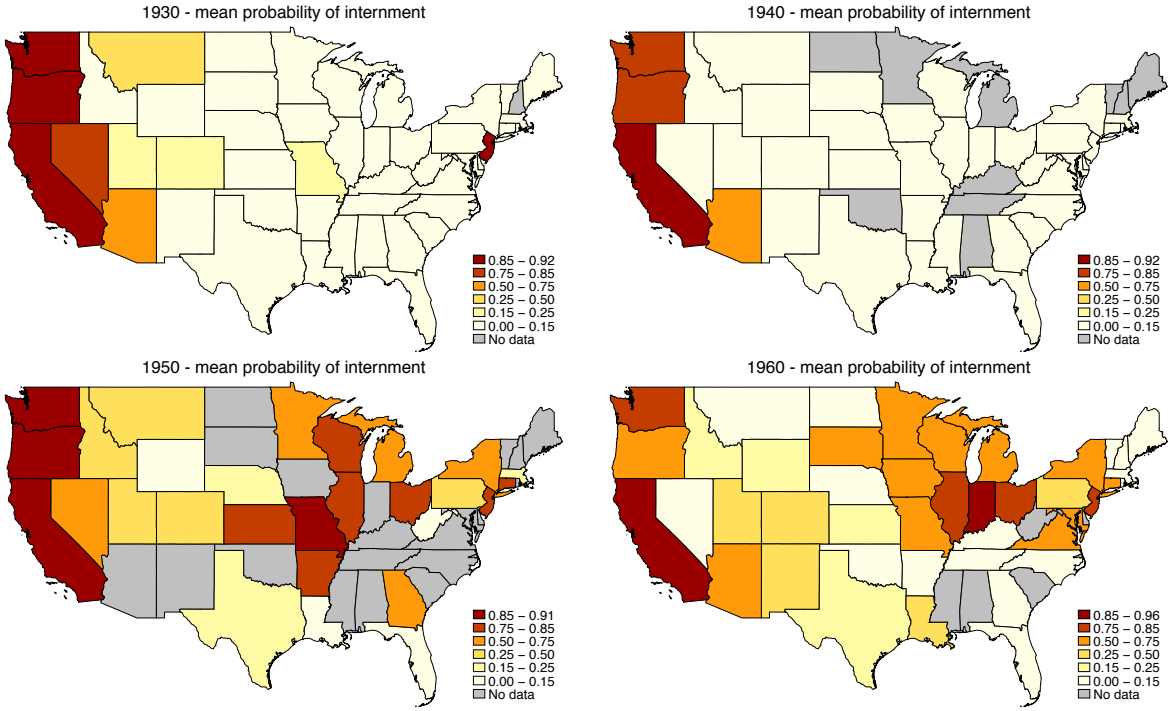
Note: Kernel density and average (vertical lines) of residual income in 1940 Census. Residuals from a regression of annual total income on birthplace dummies, a quadratic of age, and a high school completion dummy. Males, who worked at least 26 weeks during the year, born between 1896 and 1924. Census person weights are used. West Coast refers to California, Washington, Oregon, and Arizona. Other refers to remaining continental U.S.

Figure A6: Occupational distribution, 1940



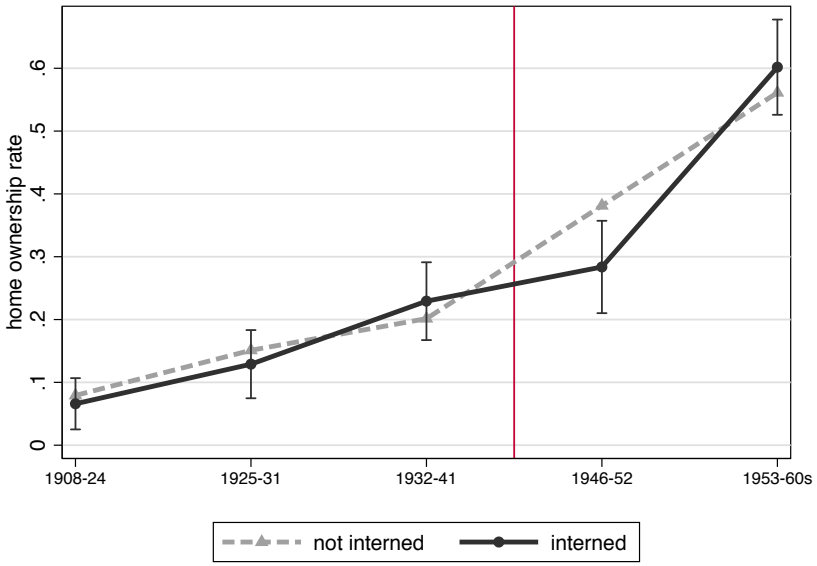
Note: Proportion of each group in each occupational category in 1940. Includes employed males, born between 1896 and 1924. West Coast refers to California, Washington, Oregon, and Arizona. Other refers to remaining continental U.S.

Figure A7: Mean probability of internment by state and Census year



Note: Average estimated probability of internment for individuals of Japanese origin in different Censuses and states of residence. Probability of internment estimated as explained in the text.

Figure A8: Home ownership rate, interned and not interned Japanese Americans



Note: 1st generation JARP respondents. Home ownership rate for interned and non-interned respondents at different points in time. 95% confidence intervals computed using robust standard errors from regressing a dummy for home ownership on an internment dummy.

Table A1: Camps' economic composition, comparison with 1940 Japanese Americans' neighborhood composition (Japanese neighbors)

		Education: some college or more		**Occupation: professional or managerial**		**Occupation: white collar (clerical, sales)**	
(1) CAMP	(2) POP.	(3) fraction of camp (adults)	(4) quantile in 1940 neighborhood distribution	(5) fraction of camp (adults)	(6) quantile in 1940 neighborhood distribution	(7) fraction of camp (adults)	(8) quantile in 1940 neighborhood distribution
Poston, AZ	18058	0.119	0.656	0.128	0.562	0.151	0.662
Tule Lake, CA	15074	0.108	0.610	0.107	0.529	0.129	0.621
Gila River, AZ	13158	0.116	0.642	0.137	0.577	0.138	0.633
Heart Mountain, WY	10919	0.127	0.674	0.200	0.682	0.165	0.706
Manzanar, CA	10151	0.109	0.617	0.148	0.585	0.180	0.718
Minidoka, ID	9515	0.112	0.634	0.210	0.703	0.161	0.700
Topaz, UT	8566	0.155	0.792	0.185	0.674	0.149	0.655
Jerome, AR	8475	0.103	0.570	0.133	0.566	0.140	0.633
Rohwer, AR	8409	0.092	0.509	0.168	0.644	0.149	0.655
Granada, CO	6916	0.142	0.760	0.155	0.588	0.182	0.719

Source: WRA internment camp records and 1940 Census full count.

Notes: Economic composition of WRA internment camps and comparison with that experienced by Japanese Americans in 1940 West Coast (WA, OR, CA, and AZ) neighborhoods, taking into account only Japanese persons in 1940 neighborhoods. (2)-Camp population in WRA records. (3)-Fraction of highly educated adult internees (educational attainment of some college or more). (4)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of highly educated Japanese adults than that in (3). (5)-Fraction of adult internees with previous professional or managerial occupations. (6)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of professional/managerial occupation Japanese adults than that in (5). (7)-Fraction of adult internees with previous white collar occupations (clerical, sales). (8)-Fraction of West Coast Japanese Americans living in 1940 in a neighborhood with a lower share of white collar occupation Japanese adults than that in (7). 1940 neighborhoods are groups of Census enumeration districts within a county as described in the text (see footnote 20), with average population of 9,480 people.

Table A2: Effect of internment on income - DiD estimates excluding 1950

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	473.83***	411.45***	476.89
	(139.38)	(141.79)	(333.83)
Education	no	no	no
Location	no	no	no
$\overline{Y}: int, post$	4894	4894	4894
% change	10.7	9.2	10.8
Observations	26890	25688	17502

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	605.24***	569.87***	387.20
	(172.07)	(176.73)	(365.82)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y}: int, post$	4729	4729	4729
% change	14.7	13.7	8.9
Observations	23882	22697	15256

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	304.80**	300.06**	179.03
	(142.96)	(143.67)	(368.95)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y}: int, post$	4894	4894	4894
% change	6.6	6.5	3.8
Observations	26890	25688	17502

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	469.83***	479.88***	167.25
	(174.60)	(177.79)	(396.35)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y}: int, post$	4729	4729	4729
% change	11	11.3	3.7
Observations	23882	22697	15256

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (5) in the text, varying the choice of control group and regressors. Using observations from 1940 and 1960. * 0.10 ** 0.05 *** 0.01. Dependent variable is annual total income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\bar{Y}: int, post$ is average total income for internees in 1960. % change computed as $\frac{\hat{\beta}}{(\bar{Y}: int, post) - \hat{\beta}} \cdot 100$.

Table A3: Effect of internment on log income - DiD estimates

(a) Baseline

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.1375*	0.1178	0.1649*
	(0.0733)	(0.0750)	(0.0976)
Education	no	no	no
Location	no	no	no
$\overline{Y}: int, post$	4433	4433	4433
% change	14.7	12.5	17.9
Observations	26271	25116	17015

(b) Education

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.2400**	0.2244**	0.2335
	(0.1011)	(0.1037)	(0.1448)
Education	yes	yes	yes
Location	no	no	no
$\overline{Y}: int, post$	4213	4213	4213
% change	27.1	25.2	26.3
Observations	23333	22182	14830

(c) Location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.0992	0.0897	0.1463
	(0.0710)	(0.0743)	(0.0986)
Education	no	no	no
Location	yes	yes	yes
$\overline{Y}: int, post$	4433	4433	4433
% change	10.4	9.4	15.8
Observations	26271	25116	17015

(d) Education and location

	CH + JP	CH only	JP only
	(1)	(2)	(3)
$\hat{\beta}$	0.1989**	0.1937*	0.2257
	(0.0986)	(0.1025)	(0.1447)
Education	yes	yes	yes
Location	yes	yes	yes
$\overline{Y}: int, post$	4215	4215	4215
% change	22	21.4	25.3
Observations	23333	22301	14830

Note: Point estimates and bootstrap standard errors of the DiD coefficient of equation (5) in the text, varying the choice of control group and regressors. * 0.10 ** 0.05 *** 0.01. Dependent variable is log annual total income in 1950 dollars. All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Males, 1896-1924 birth cohorts who worked at least 26 weeks during the past year. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns (1) include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns (2) exclude Japanese with zero probability of internment. Columns (3) exclude Chinese. $\overline{Y}: int, post$ is average total income for internees in 1950-60. % change computed as $(exp(\hat{\beta}) - 1) \cdot 100$.

Table A4: DiD estimates: =1 if worked for at least half of last year

	CH + JP	CH only	JP only
	(1)	(2)	(3)
Baseline	0.0050	-0.0012	-0.0104
	(0.0273)	(0.0284)	(0.0372)
Education	0.0095	-0.0057	-0.0273
	(0.0314)	(0.0323)	(0.0332)
Location	0.0027	0.0040	0.0008
	(0.0266)	(0.0280)	(0.0402)
Education and location	0.0004	-0.0072	-0.0086
	(0.0301)	(0.0317)	(0.0364)

Notes: Each cell corresponds to a different regression. Point estimates and bootstrap standard errors of the DiD coefficient of equation (5) in the text, varying the choice of control group. * 0.10 ** 0.05 *** 0.01. The dependent variable is a dummy that equals one if a person worked for at least half of the previous year (which determines inclusion into the main income regressions). All specifications control for age and birthplace. Observations weighted by Census person weights. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Male, 1896-1924 cohorts. Specifications controlling for education exclude 1920-1924 birth cohorts. Column 1 includes Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Column 2 excludes Japanese with zero probability of internment. Column 3 excludes Chinese.

Table A5: DiD estimates: Hours and weeks worked

	Hours worked			Weeks worked		
	CH + JP	CH only	JP only	CH + JP	CH only	JP only
	(1)	(2)	(3)	(4)	(5)	(6)
Baseline	0.53	0.52	0.29	-1.41	-1.65*	1.11
	(0.81)	(0.83)	(1.50)	(0.89)	(0.91)	(1.63)
Education	1.89*	1.93*	1.65	-1.58	-1.96	1.90
	(1.02)	(1.04)	(1.59)	(1.17)	(1.21)	(2.36)
Location	0.95	0.92	1.63	-1.34	-1.58*	0.87
	(0.81)	(0.84)	(1.53)	(0.88)	(0.91)	(1.64)
Education and location	2.25**	2.29**	2.67*	-1.59	-2.01	1.66
	(1.00)	(1.04)	(1.53)	(1.22)	(1.24)	(2.26)

Notes: Each cell corresponds to a different regression. Point estimates and bootstrap standard errors of the DiD coefficient of equation (5) in the text, varying the choice of control group and regressors. * 0.10 ** 0.05 *** 0.01. In columns 1-3 the dependent variable is hours worked last week (week prior to each year's Census). In columns 5-6 the dependent variable is weeks worked last year. Both hours and weeks in the Census are originally intervalled (WKSWORK2 and HRSWORK2). I assign each individual the midpoint of his hours/weeks interval. All specifications control for age and birthplace. Observations weighted using person weights. I include observations with dependent variable greater than zero. Education is a dummy variable controlling for high school completion. Location controls for time-invariant fixed effects of 5 U.S. partitions as described in the text. Male, 1896-1924 cohorts. Specifications controlling for education exclude 1920-1924 birth cohorts. Columns 1 and 4 include Japanese in continental U.S. and Chinese in the West Coast (AZ, CA, OR, and WA). Columns 2 and 5 exclude Japanese with zero probability of internment. Columns 3 and 6 exclude Chinese.

B Japanese American Research Project: Representativeness

In Section 3 in the text I summarize the sampling procedure of the Japanese American Research Project (JARP) surveys. I refer the interested reader to Levine and Rhodes (1981) who describe the survey in detail. Their book includes descriptions of the sampling procedure and how representative is the sample of the entire Japanese American population up until that time.

In terms of sample representativeness, Levine and Rhodes (1981) caution that those Issei with the least connections to the community were more likely to be left out of the comprehensive list from which Issei were sampled. In addition, Nisei and Sansei descendants of the eldest Issei (those families in which husband and wife had both died by the early 1960s) were excluded from the survey. In spite of these potential issues, they express their assurance in the quality of the sample: *"it is good enough [...] to enable to draw some tentative conclusions about processes among the Japanese Americans* (p.23)."

I provide some additional information on the representativeness of the JARP sample by comparing it to Japanese Americans in the 1960 Census sample. The timing does not completely align since the JARP surveys were carried out between 1963–1967. Based on this I focus on comparing immutable characteristics (place and time of birth), and state of residence (not expected to change dramatically during the 1960s since post-internment migration had stabilized by then).

The results from this comparison, shown in Appendix Table B1, are reassuring. At the very least they rule out glaring disparities between the JARP sample and the Census. The first part of Appendix Table B1 reports the percentage of each sample residing in the four states targeted for internment (California, Washington, Oregon, and Arizona) and the three states outside of those initial four where more Japanese people resided in 1960 (Illinois, New York, and Colorado). The percentage of Japanese Americans in each state align pretty well across the two samples. For instance, 64.1% of Japanese Americans in the 1960 Census were living in California with the corresponding JARP number being 64.74% . For Colorado, with a much lower share of Japanese Americans, the numbers are respectively 2.64% and 2.22%. The largest disparity shows up in New York where the corresponding numbers are 3.67% and 1.33%.

The second part of Appendix Table B1 shows that the percentage of US-born is rather comparable: 72% in the Census and 75% in JARP. Finally, the third part of Appendix Table B1 compares the time-of-birth distribution. While there are some differences between the two (as Levine and Rhodes (1981) suggested) they are arguably not very large. Overall, Levine and Rhodes (1981) original representativeness claim above seems a reasonable one.

Table B1: JARP representativeness: Comparison with Japanese Americans in 1960 Census

	1960 Census	**JARP**
Place of residence (%)		
California	64.10	64.74
Washington	7.31	6.57
Oregon	1.89	1.42
Arizona	.43	.8
Illinois	5.85	6.22
New York	3.67	1.33
Colorado	2.64	2.22
Born in the US (%)	71.58	74.97
Birth cohort (%)		
1896-1901	11.89	14.81
1902-1907	11.72	9.94
1908-1913	10.72	8.52
1914-1919	27.36	31.85
1920-1924	38.31	34.89

Notes: State of residence, fraction born in the US, and birth cohort group of Japanese Americans in 1960 Census (continental US) and JARP survey respondents. 1896-1924 birth cohorts. JARP survey was conducted between 1963–1967.

C Sample Stability and Endogenous Attrition

A concern arising from the lack of panel data is sample stability. An issue would arise if during the time period of study, selective in- or out-migration took place in ways that jeopardized my difference-in-difference (DiD) strategy.

International in-migration

With respect to international in-migration, I believe this should be less of a concern due to the restrictive migration laws of the time. Asian migration was completely shut off with the Immigration Act of 1924, making the Japanese and Chinese Americans still present in the country in 1940 likely to be those that had established in the country for the long run. It was not until the Immigration Act of 1952 was passed that very small quotas were assigned for Asians (see Appendix Figure A1). In order to exclude potential recent migrants after internment, the DiD sample drops people in the 1950 Census who were Asian-born and declare living in Asia one year ago. In the 1960 sample, I exclude those people who were born abroad and were living abroad 5 years ago.

Sample stability in observables

Appendix Figure C1 provides a sense of the stability of the DiD sample in terms of immutable observable characteristics, separately for Japanese Americans and West Coast Chinese Americans. The three samples stay relatively stable in terms of time and place of birth. Difference in means between 1950–60 and 1940 are mostly not statistically significant, although the confidence intervals for the 1950 1% sample are somewhat wide. If anything, the sample becomes slightly younger. This could be due to mortality, and out-migration. I discuss the latter in turn.

Migration to Japan due to internment, and DiD "worst-case" robustness

Some might worry that the average positive effect of internment on long-run incomes is driven by selective migration to Japan after 1945. Indeed, if many decided to migrate to Japan because of internment, and these people were negatively selected in terms of earnings potential, we could expect to find a spurious positive estimate.

However, the historical circumstance arguably reduces this type of concern. Because of strict immigration laws described above, interned Japanese Americans were either born in the US (around 65% of internees), or had been living in the country for at least 18 years at the time of internment. Thus, internees had a strong attachment to the US, making migration to Japan arguably less likely. Moreover, post-WWII Japan was a devastated country, with severe shortages, and occupied by allied forces (mostly U.S. and British).

Historical accounts provide some information on the number of Japanese Americans that left for Japan following internment. Daniels (2004) quantifies it in a total of 4,724 people (around 4% of internees). Out of this total, 1,659 were Issei, 1,949 were Nisei minors accompanying their parents, and 1,116 were adult Nisei. The historical literature explains how the main motivations for those who left were non-economic: anger toward the U.S. and national pro-Japanese sentiment. This aligns with the dire economic conditions in Japan. Moreover, it arguably reduces the concern that those who left were the ones with differentially bad economic prospects in the U.S. In any case, I next perform an empirical exercise designed to understand how the DiD results would fare in a "worst-case" scenario—not necessarily a *likely* scenario—of very negatively-selected migration.

"Worst-case" robustness exercise using placebo observations

Using the figures provided by Daniels (2004), I perform an exercise designed to assess whether the DiD estimates are robust to very negatively-selected migration induced by internment. The approach consists of adding "missing", or "placebo", observations of internees to the *post* sample (1950 and 1960), assigning them low levels of income, and checking how does the DiD estimate change. This "worst-case scenario" approach is similar in spirit to bounding exercises in Lee (2009) and Horowitz and Manski (2000). Note that the exercise is not meant to capture what is the "right" parameter, but to understand the properties of the DiD approach in a "worst-case" scenario of heavily-selected out-migration.

I begin by considering the 1,388 male adult internees who left to Japan according to Daniels (2004).[1] I then make a series of conservative assumptions. First, I assume that these adults were *all* in the 1896-1924 birth cohorts that compose the DiD sample. Second, I assume that all who left did so *because of* internment and would not have done so otherwise. These assumptions imply adding all 1,388 people as "placebo" observations to the *post* sample. Since the 1950 and 1960 Census samples have, respectively, a 1% and 5% coverage, I add 14 and 70 "placebo" observations to the 1950 and 1960 samples, respectively. These numbers are small because the number of people who left was small, and because the Census sample coverages are relatively low. In any case, these "placebo" observations are assigned Census person weights in the DiD estimation (like all other observations).

Appendix Figure C2 reports DiD coefficients estimated using the sample with added "placebo" *post* observations, with varying levels of low income and predicted internment probability. The comparable point estimate from Table 5 in the text is 563.92.[2] The horizontal axis in Appendix Figure C2 assigns varying income levels to "placebo" observations: different below-median percentiles of the 1950- and 1960-specific income distribution of Japanese Americans. The vertical axis assigns varying predicted probabilities of internment to "placebo" observations: from 0.5 to 1.[3]

Appendix Figure C2 suggests that the positive effect of internment on income is rather robust even to very dramatic forms of negatively-selected sample attrition. Not even in the worst scenario—in which all migrants are assigned the 5th income percentile and a predicted internment probability of 1—do we get a negative point estimate. Positive, statistically and economically significant estimates are still found under severely-selected scenarios of sample attrition: assigning all migrants the 10th percentile of the income distribution and an estimated probability of internment of 0.9 results in an estimate of 306.72, statistically significant at the 5% level.

Overall this exercise—together with the historical evidence—suggests that, even under conservative (and arguably implausible) assumptions, the estimated positive effects of internment are unlikely to be driven by negatively selected migrants to Japan.

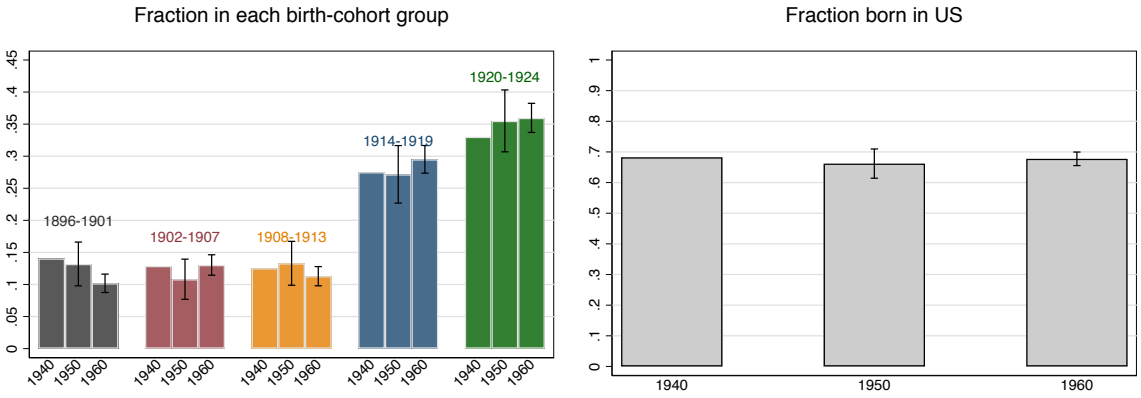
[1] I assume men and women migrants are split 50-50.

[2] I focus on the baseline specification since additional covariates would make the procedure more complicated and lead to an increased number of implementation choices.

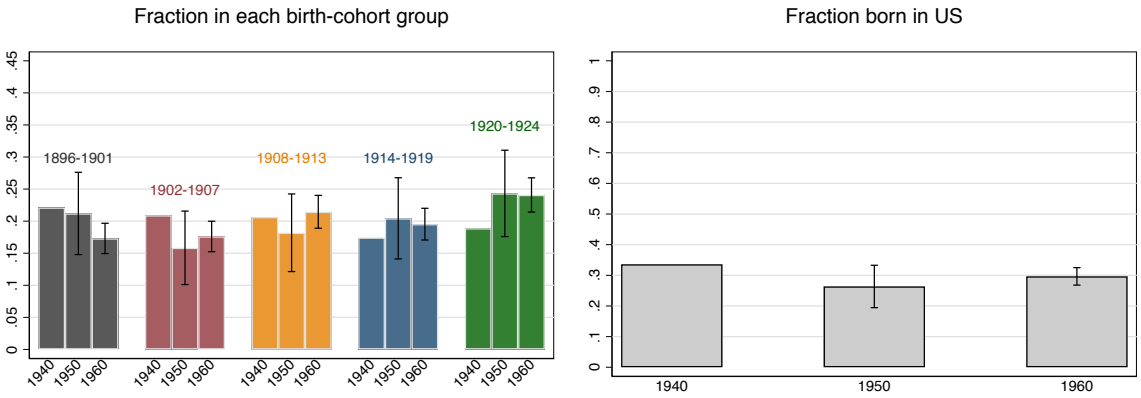
[3] Note that a predicted probability of 1 does not systematically arise in the "true" DiD sample, making estimates with probability equal to 1 not only "worst-case" but also specially implausible.

Figure C1: Sample stability: 1896–1924 birth cohorts in the 1940, 1950, and 1960 Censuses

(a) Japanese

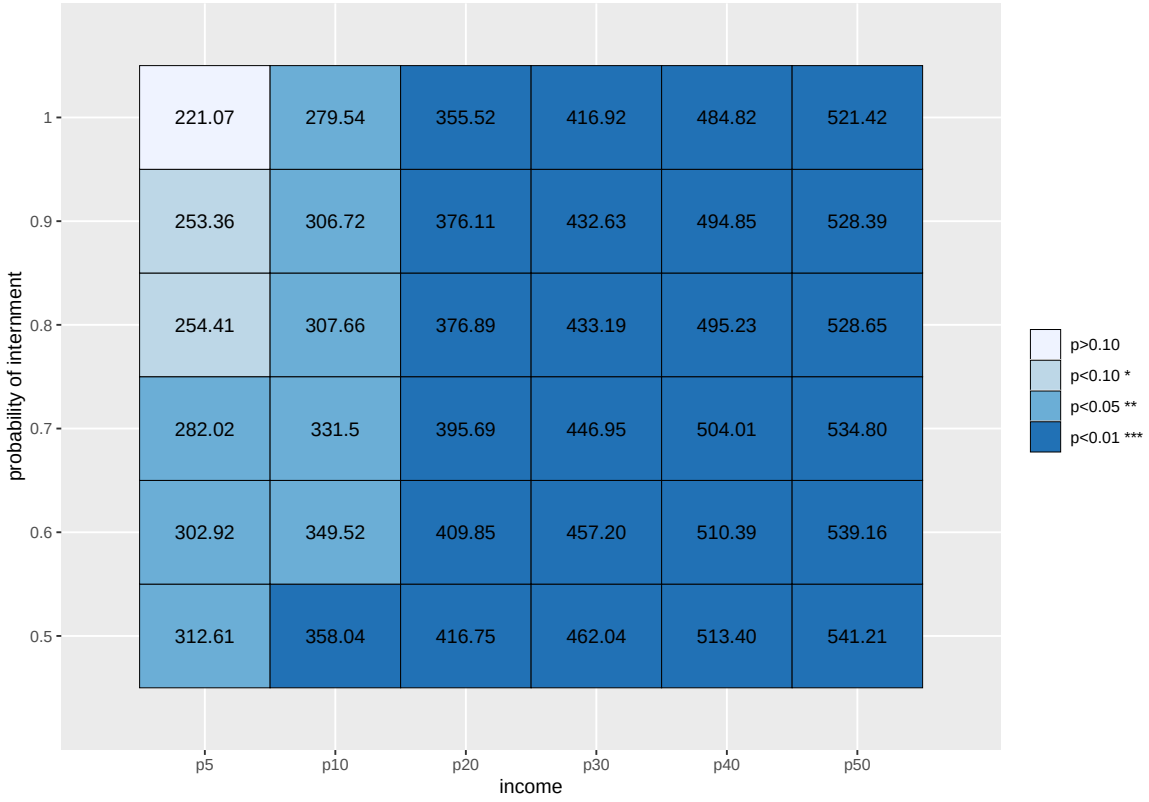


(b) West Coast Chinese



Note: Distribution of time-invariant characteristics of Japanese American and West Coast Chinese American men from the 1896–1924 birth cohorts (cohorts from the diff-in-diff analysis) in the 1940 Census (full count), 1950 Census (1% sample), and 1960 Census (5% sample). The first figures on each row show the fraction of people from each Census year who belong to any given birth-cohort group. The second figures on each row show the fraction of people from each Census year who were born in the continental US. Means for the 1950 and 1960 samples include a 95% confidence interval.

Figure C2: "Worst-case" migration scenario: DiD effects under different placebo movers' income and internment probability



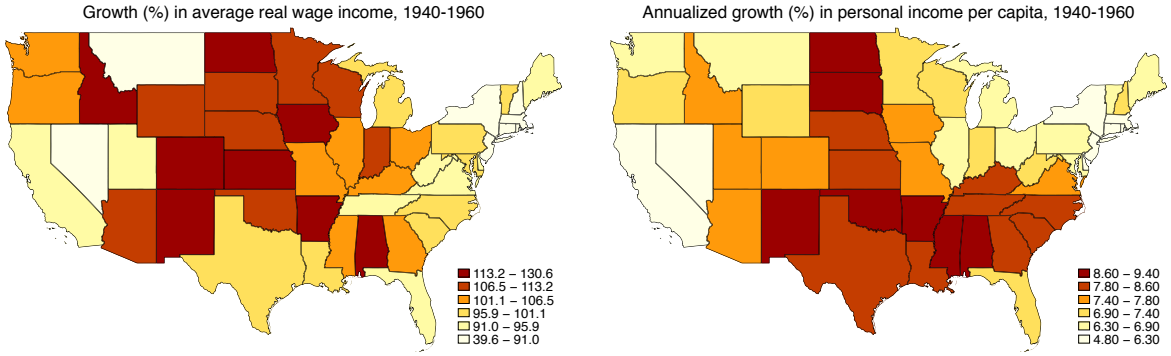
Note: Point estimate and statistical significance of the DiD coefficient from equation (5) in the text when adding to the "post" sample placebo movers to Japan with differing income and probabilities of internment. Estimates corresponding to Baseline, CH+JP specification in Table 5 (original point estimate equal to 563.92). Number of movers added to the sample match those who left to Japan after internment according to Daniels (2004). Income of placebo movers include different percentiles of the 1950- and 1960-specific income distribution of the Japanese original DiD sample.

D Smart Moves?

Did internees who changed their state of residence after internment make "smart moves"? The postwar period was one of economic prosperity, but some places experienced greater growth than others. While movers who re-optimized could have increased their earnings even when moving from more to less generally prosperous places (e.g. Nakamura et al., 2019), it is interesting to check whether former internees who moved did so to areas of the country that turned out to experience greater growth than the ones they left behind. Shoag and Carollo (2016) document how geography mattered in determining the relative prospects of different internees.

I construct two measures of state-level economic growth between 1940–1960. The first is the growth in average real wage income between 1940 and 1960. I construct this measure using Census microdata from 1940 and 1960. The second measure, from the Bureau of Economic Analysis, is the state-level annualized percentage growth in personal income per capita between 1940–1960. Appendix Figure D1 shows the distribution of these two measures across states. Between 1940–1960 the average state roughly doubled its real average wage income and experienced an average growth in personal income per capita of 7.4% per year. The correlation between these two measures of state-level income growth is 0.71.

Figure D1: State-level growth in incomes, 1940–1960



Note: Left panel displays the state-level growth in average real wages between 1940–1960 (IPUMS Census data). The right panel displays the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). The correlation between these two measures of state-level income growth is 0.71.

How did the states that former-internee movers go to fare during the postwar boom in comparison to the places they left behind? Appendix Table D1 answers this for those who were living in California before internment and settled elsewhere afterwards (83% of internees were previously living in California). Appendix Table D1 shows that, according to these measures, California did not boom as much between 1940–1960 when compared to the five most popular places these former internees moved to (Illinois, Ohio, Colorado, Utah, and Michigan). In the table, California features the lowest per-capita income growth and the second-to-lowest growth in average wage income.

Appendix Table D2 now considers all former-internee movers and all destinations. It computes the (mover-weighted) average income growth between 1940–1960 in the states that movers went to and the ones they left behind. In the aggregate the same pattern as in the California example arises. The places former-internee movers were living before WWII experienced less of a postwar boom than the ones they went to after internment.

Table D1: Income growth 1940–1960 in top 5 destinations for former-internee movers who were previously living in California

(1) **state**	(2) % **who moved to state**	(3) $\Delta\bar{w}_{1960,1940}$ (%)	(4) $\Delta\bar{Y}_{1960,1940}$ (%)
Illinois	32.74	101.6	6.6
Ohio	10.32	101.2	6.7
Colorado	8.93	119.7	7.8
Utah	7.74	93.1	7.7
Michigan	6.55	97.8	6.5
California	—	95.9	6.3

Notes: Column (1) lists the five top destinations of former internees who before internment lived in California and who moved to another state afterward (JARP survey data). Column (2) shows the percentage of this group of movers who went to each of the states in column (1) (JARP survey data). Column (3) displays the state-level growth in average real wages between 1940–1960 (IPUMS Census data). Column (4) displays the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). Numbers for California are shown for comparison.

Table D2: Average 1940–1960 growth in former and new states of residence

	$\Delta\bar{w}_{1960,1940}$ (%)	$\Delta\bar{Y}_{1960,1940}$ (%)
State after move	101.4	6.9
Pre-internment state	98	6.5

Notes: For those who were interned and changed states of residence before and after internment, this table computes the average 1940–1960 growth in incomes of the states they left behind and the ones they went to. $\Delta\bar{w}_{1960,1940}$ is the state-level growth in average real wages between 1940–1960 (IPUMS Census data). $\Delta\bar{Y}_{1960,1940}$ is the state-level compounded annual growth rate in personal income per capita between 1940–1960 (Bureau of Economic Analysis). State averages weighted by number of people that moved from and to each state.